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Plate IV

PUBLIC SCHOOL METHODS

A SERIES OF
PRACTICAL HOME STUDIES IN PEDAGOGY

EDITED BY

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PRIMARY METHODS

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VOLUME TWO

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CHICAGO
INTERSTATE SCHOOL OF CORRESPONDENCE,
AFFILIATED WITH
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LESSON TWELVE

THIRD YEAR NUMBER WORK

1. **Text-Book Work.**—One great difficulty which teachers encounter in number work lies in the introduction of the text-book. Often children who have previously done very good work seem almost unable to proceed when the book is put into their hands. This will be avoided if the right sort of preparatory work is done.

(*a*) PRELIMINARY STEPS. Be sure that the pupils can read and understand the problems before the text-book is placed in their hands. As a rule, the pupils will be more or less embarrassed by the book, although it contains but few words with which they are not familiar. The embarrassment arises from the fact that the book is to be used for a new purpose. The attention is centered upon the number facts more than upon the reading, and the first few pages should contain nothing with which the pupils are not already familiar.

(*b*) PREPARATORY LESSONS. Special preparatory lessons should always precede the introduction of the book. These lessons should be so planned as to make adequate preparation for the different pages, and they will naturally vary considerably. For some pages merely a word or two of explanation will suffice; for others, a brief oral review will do; again, for others, two or three preparatory lessons which include oral work, blackboard and written work will be found necessary; but bear in mind that there is scarcely a page of text-book matter but what will need some prepara-

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tion before the children can take it up and carry it through successfully and easily. It is no wonder that children stumble over work that ought to be easy, when we consider how often they are given work to do for which they have had no preparation. Suppose that it has been six weeks or two months since a child has had problems in liquid measure, and he suddenly comes to this problem in his book: "How many gallons in twelve quarts?" Six out of ten children would probably stumble on the question, guess at the answer, and waste a good deal of time before they got it. If the teacher had spent a very few minutes recalling the table of liquid measure and rapidly giving a few problems before the lesson was taken up, the problem, with similar ones that would undoubtedly follow, would be readily solved. Or the teacher might, on the preceding day, give a few problems which would recall all of the work in liquid measure and use these problems for the busy work for that day. This preparation would serve just as well.

(c) ILLUSTRATIVE LESSON. The following will illustrate how a text-book lesson may be taken up:

"1. One dollar is equal in value to —— half-dollars.

"2. One dollar is equal in value to —— fourth-dollars.

"3. One half-dollar is equal in value to —— fourth-dollars. A fourth-dollar is sometimes called a 'quarter,' or a *quarter of a dollar.*

"4. One half of a dollar and one fourth of a dollar are —— fourths of a dollar.

"5. One half of a dollar less one fourth of a dollar is —— of a dollar.

"6. Four times one fourth of a dollar equals —— fourths of a dollar, or —— dollar.

"7. One fourth of a dollar is contained in one half of a dollar —— times.

"8. One half of one half of a dollar is —— —— of a dollar."[1]

Material. When ready for the lesson, the teacher should state that before using their text-books a short review is to be held. She should bring to the class a dollar, a half-dollar and a quarter.

Method. After briefly stating the purpose of the lesson, the teacher may ask, "John, what is the name of this coin?" (Holding up a dollar.)

"It is a dollar."

"How many cents does it equal?"

"One hundred."

"What is the name of this coin?" (Holding up a half-dollar.)

"One half-dollar or fifty cents."

"How many of these does it take to make one dollar?"

"It takes two."

"We say that one dollar is equal in value to two half-dollars. One dollar is equal in value to how many cents?"

"To one hundred cents."

"Two half-dollars are equal in value to how many cents?"

"To one hundred cents."

"What is the name of this coin?" (Holding up a quarter.)

"A quarter or a twenty-five-cent piece."

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[1] The *Werner Arithmetic*, Book II.

"You say it is a quarter. A quarter of what?"

"A quarter of a dollar."

"What is another name for a quarter of anything?"

"A fourth."

"Then this (holding up the quarter) is equal in value to what part of a dollar?"

"It is equal in value to one fourth of a dollar."

"It is equal in value to how many cents?"

"To twenty-five cents."

"This piece of money (holding up a half-dollar) is equal in value to how many quarters?"

"It is equal in value to two quarters."

"This (holding up the dollar) is equal in value to how many quarters?"

"It is equal to four quarters."

"One dollar is equal in value to how many half-dollars?"

"To how many fourth-dollars?"

"One half of a dollar is how many fourths of a dollar?"

"Two."

"One half of a dollar and one fourth of a dollar are how many fourths of a dollar?"

"They are three fourths of a dollar."

"If I had one half of a dollar and took away one fourth of a dollar, how much would I have left?"

"One-fourth of a dollar or twenty-five cents."

"How many times must I take one-fourth of a dollar to make one half of a dollar?"

"Two times."

"Another way of saying that is to say that one fourth of a dollar is contained in one half of a dollar two times. One fourth of a dollar is contained in one dollar how many times?"

"It is contained in one dollar four times."

"One half-dollar is contained in one dollar how many times?"

"It is contained two times."

"Read this first problem (pointing to the board) and in place of this line, put the words 'how many.' "

A child reads, "One dollar is equal in value to —— half-dollars," supplying the words as directed.

Enough problems are given to accustom the children to supplying the words, "how many." Other problems are read in which they have to supply the words, "what part." A few problems requiring the words, "is contained in," are given, the word "contained" being told by the teacher if the pupil hesitates.

The text-book may now be used, the attention of the children being called to the pictures at the top of the page. They tell what they see, then solve the problems. Since the meaning of the new phrases has been made clear, the children will have little difficulty in understanding the problems. So, in every lesson, new expressions and new forms of problems should first be made perfectly clear. A teacher needs to be constantly on guard to see that every problem is understood. Ask often for the meaning of the problems or the meaning of a word. Teach the child that in every problem he must look for three things, viz.: what is given, what is required, and the process by which the result is obtained. It is well occasionally to have problems in which these three factors are told by the child with no attention paid to the answer.

2. Reduction of Denominate Numbers.—During the preceding years the children have been thoroughly grounded in the tables of liquid measure, dry measure, United States money and possibly one other table. They can readily change quarts to gallons, gallons to pints, dimes to nickels, etc., but having no knowledge of the meaning of multiplication and division at the time when these facts were learned, they did not formulate any rule for the reduction of denominate numbers. This lesson will show how the rules for the reduction of pints to quarts and quarts to gallons may be taught. Rules for the reduction of other denominate numbers may be taught in a similar manner.

ILLUSTRATIVE LESSON. *Material.* The measures and water should be at hand in case any child has forgotten the facts or cannot reduce quantities readily.

Method. This lesson should begin with a short review of the table of liquid measure. For the review, questions somewhat like the following may be asked: "May, how many pints in one quart?" "How many pints in two quarts?" "Harry, how many quarts in one pint?" "In two pints?" "In four pints, class?" "Nellie, how many quarts in a gallon?" "How many quarts in three gallons, John?" "How many gallons in eight quarts?" "In twelve quarts?" "Who can say the little table about pints, quarts and gallons?"

"Two pints make one quart.
Four quarts make one gallon."

"We are going to find out to-day whether we cannot make some rules to help us in changing from pints to quarts, quarts to gallons, and back again from gallons to quarts and quarts to pints." "Suppose that I have six pints of milk. How many quarts have I, Robert?"

"You have three quarts."

"Class, how did Robert know that six pints is the same as three quarts?"

"He knew that one quart was two pints, another one would be two more, or four pints, and another quart would make six pints."

"True, but can we not find a shorter way to tell it? Suppose that I had twenty pints that I wanted to change to quarts. Must I say that one quart is two pints, another is two more, another two more, and two more and two more and so on until I have used up twenty pints? Think how long it would take. I'm sure you do not do that when I ask you how many quarts there are in twenty pints. How many quarts are there?"

"Ten."

"How do you know?"

"Because there are ten twos in twenty."

"How many quarts in sixteen pints?"

"Eight."

"How do you know?"

"Because there are eight twos in sixteen."

"Tell us that at the board."

The child writes, 8 × 2 = 16.

"Suppose, though, that we do not know how many twos there are in a certain number? How can we find out?"

"We can divide."

"Divide what?"

"We can divide the number by two."

"Show me by dividing how many twos there are in 44." "In 62." "In 84."

"I have 68 pints of milk. Show me by division how many quarts I have." "In the same way show me how many quarts in 88 pints."

"In 42 pints."

"Who now can make a rule for us that will always help us to change pints to quarts very quickly? Make your rule very exact and word it carefully."

"To change pints to quarts, divide the number of pints by two."

Following this same plan, the children will readily tell how to change quarts to gallons and then the rule may be developed that to change from a quantity of a certain order to a quantity of a larger order we must always divide.

It is a very simple matter to secure from the children the rule that to change from a quantity of a certain order to one of a lower order we must multiply. Liquid measure may be taken up first and the rule for changing from gallons to quarts quickly developed, as follows:

"Marjorie, how many quarts in one gallon?" "How many quarts in two gallons, class?" "In four gallons?" "In six gallons?" "Tell me how you find it."

"In one gallon there are four quarts, so in six gallons there are six times as many quarts."

"I have a certain number of gallons of oil. I am not going to tell how many, but I want to know how I can find out how many quarts there are."

"You must multiply the number of gallons by four."

"Put that in the form of a rule."

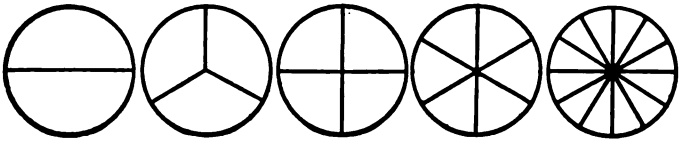
"To change gallons to quarts, multiply the number of gallons by four."

The rule for changing quarts to pints may now be developed. Dry measure may be taken up next, then money, then linear measure. Rules should be developed in each case until it is perfectly clear to the children that when we change a quantity of one order to a quantity of higher order, division always takes place, and when we change a quantity to a quantity of lower order, multiplication takes place.

Caution. Teachers are too apt to think that it is a waste of time to develop rules from the children and, consequently, give the rule themselves and feel satisfied if the pupils perform the operations. Do not be a teacher of this sort. Make your pupils think instead of doing their thinking for them. Do not be content to have a lot of little machines grinding out answers to problems, but seek to develop reasoning power and judgment. In no other subject is there greater opportunity for doing this than in arithmetic, and only insomuch as this result is accomplished is number work of practical value.

3. **Addition of Fractions.**—ILLUSTRATIVE LESSON. Purpose of the lesson: To develop the rule for the addition of fractions.

Material. On the board have five large circles as follows:



Method. In beginning the lesson the teacher says to the class, "Not long ago we found out what a fraction is and why we call it a fraction. To-day we are going to find out something new about fractions. How many parts in this first circle?"

"Two parts."

"Each part is called what?"

"Each part is called one half."

"What is each part in the second circle called?" (One third.) "In the third?" "The fourth?" "The fifth?"

"In one whole how many twelfths?"

"Twelve twelfths."

"In one half how many twelfths?"

"Six twelfths."

"In one third how many twelfths?"

"Four twelfths."

"In one fourth how many twelfths?"

"Three twelfths."

"In one sixth how many twelfths?"

"Two twelfths."

"In one half and one twelfth how many twelfths?"

"Seven twelfths."

"In one third and one twelfth how many twelfths?"

"In one fourth and one twelfth?"

"In one sixth and one twelfth?"

"If I had two and one half apples and some one gave me a twelfth of another, how many apples would I have?"

"You would have two and seven twelfths."

"Then two and one half plus one twelfth equals what?"

"It equals two and seven twelfths."

"I will write that for you." (Writes $2\frac{1}{2} + \frac{1}{12} = 2\frac{7}{12}$.)

"If John had one and one third apples and Rena gave him three twelfths more, how many would he have?"

"He would have one and seven twelfths."

"Harry, tell us at the board what one and one third plus three twelfths equals."

It is written.

"Here is a harder problem. You will have to think carefully." "If I had one half of an orange and one third of it and one twelfth of it, how much would I have?"

"You would have eleven twelfths."

"How do you know?"

"Because one half is six twelfths, one third is four twelfths and one twelfth is one twelfth, so all together they make eleven twelfths."

"Suppose we write that." The teacher writes $\frac{1}{2} + \frac{1}{3} + \frac{1}{12} = \frac{6}{12} + \frac{4}{12} + \frac{1}{12}$, or $\frac{11}{12}$. She then says, "Add this" (writing $\frac{1}{2} + \frac{1}{4} + \frac{3}{12}$). When the answer is given, the teacher writes, $\frac{1}{2} + \frac{1}{4} + \frac{3}{12} = \frac{6}{12} + \frac{3}{12} + \frac{3}{12} = \frac{12}{12}$, or 1. The following problems are then given:

$$\frac{1}{3} + \frac{1}{4} + \frac{1}{12} = ? \quad \frac{1}{3} + \frac{1}{6} + \frac{4}{12} = ? \quad \frac{1}{4} + \frac{1}{2} + \frac{6}{12} = ?$$
$$\frac{1}{6} + \frac{2}{3} + \frac{3}{12} = ? \quad \frac{3}{4} + \frac{1}{2} + \frac{1}{12} = ? \quad \frac{2}{3} + \frac{3}{4} + \frac{1}{12} = ?$$

In each case the results are written out as shown above. The teacher then says to the class, "I want you to tell me exactly what you did when you added these fractions" (pointing to the problem $\frac{1}{3} + \frac{1}{4} + \frac{1}{12} = \frac{4}{12} + \frac{3}{12} + \frac{1}{12}$, or $\frac{8}{12}$).

"We changed the one third and one fourth to twelfths and added them to the one twelfth."

"In other words, you changed these two fractions (one half and one third) to fractions of another name. What new name did you give them?"

"Twelfths."

"What new name did you give these?" "These?" "These?" (Pointing to different problems.)

"Well, what made you change them to twelfths?"

"So that we could add them."

"Why didn't you change this one half ($\frac{1}{2} + \frac{1}{3} + \frac{1}{12} = \frac{6}{12} + \frac{4}{12} + \frac{1}{12}$) to fourths and say that $\frac{1}{2} + \frac{1}{3} + \frac{1}{12} = \frac{2}{4} + \frac{4}{12} + \frac{1}{12}$?" "Won't this do?"

"No."

"Why not?"

"The fractions must have the same name."

"Did you give them the same name in all of these other problems?"

"Yes."

"Must they always have the same name?"

"Yes."

"Very well. Who, then, can make a rule for us telling us how to add fractions?"

"To add fractions change them to fractions having the same name."

"Add these fractions for me." (The teacher writes $\frac{1}{2} + \frac{3}{4}$.)

"One half equals six twelfths; three fourths equals nine twelfths. Six twelfths and nine twelfths equal fifteen twelfths."

"You did that correctly, but there is a much easier way to add those fractions. Who sees it?"

If no one does, the teacher rapidly draws two circles, dividing one into halves, the other into fourths.

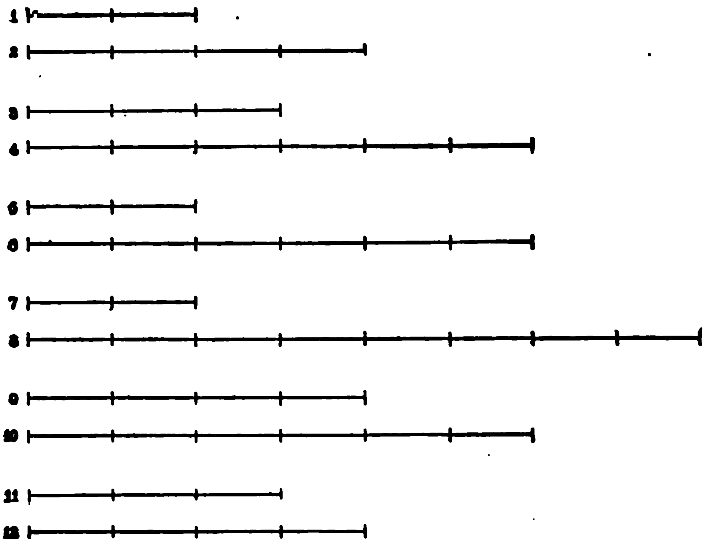
"Now who sees how to add one half and three fourths?"

The children readily see that the fractions can be added by changing them to fourths. In the same way show that halves and thirds may be added by reducing them to sixths; halves and sixths to sixths; thirds and sixths to sixths, in each case emphasizing the fact that while it is not wrong to change them to twelfths, it is easier and better to change them to fractions with smaller names. When this fact has been firmly fixed, the teacher may say, "Harry gave us a good rule for adding fractions. Who now can add something more to that rule to make it even better?" The new rule given may be very crude, but never mind. If it states the facts, that is all you want. Furthermore, never discourage a child when he is attempting to form his own rules, but give all the praise you possibly can. In all probability the rule which the children now give will be somewhat as follows: "To add fractions, change them to fractions having the same name. Make the new name as small as you can, and then, when the fractions all have the same name, add them." Though the rule lacks conciseness, for the first attempt it certainly should be praised. Later on, it can be polished and made more concise.

Following this same plan, the rule for subtraction of fractions may be developed. The same figures may also be used in teaching multiplication and division of fractions.

Caution. Do not think that the lesson as outlined above is to be finished at one recitation. It may take two, three, four, five or even more, according to the class and the readiness with which they grasp new ideas. Take plenty of time with the beginning work and you will find that time will be saved in the end.

4. Ratio and Proportion.—ILLUSTRATIVE LESSON.



Material. Lines drawn as above are on the board. The lines should be long enough so that they can be readily seen. If the first line is drawn twelve inches long and the second twenty-four, they will be found to serve the purpose very well.

Method. The teacher says to the class, "I have drawn some lines on the board this morning which I want you to compare. We shall call each of these divisions one inch." "In line marked *1*, how many inches are there?"

"There are two inches."

"In line marked *2*, how many inches?"

"There are four inches."

"Line *1* is what part of line *2*?"

"Line *1* is one half of line *2*."

"I am going to tell you a new way of saying that. We say that the ratio (writing the word) of line *1* to line *2* is one half."

"We also say that the ratio of line *2* to line *1* is two. Who sees why?"

"Because it is twice as long."

"What is the length of line *3?*"

"Three inches."

"Of line *4?*"

"Six inches."

"Line *3* is what part of line *4?*"

"It is one half of line *4*."

"Who, then, can tell me what the ratio of line *3* to line *4* is?"

"The ratio of line *3* to line *4* is one half."

"What is the ratio of line *4* to *3?*"

"The ratio is two."

"What is the ratio of line *5* to *6?*"

"The ratio of line *5* to *6* is one third."

"What is the ratio of line *6* to *5?*"

"The ratio of line *6* to *5* is three."

"What, then, is the ratio of two inches to six inches?" "Of six inches to two inches?" "Of two apples to six apples?" "Of six apples to two apples?" "Of two bushels of corn to six bushels?"

"Look closely at lines *7* and *8* and tell me the two ratios."

"The ratio of line *7* to line *8* is one fourth, and the ratio of line *8* to line *7* is four."

"In lines *9* and *10* we have something harder. How many inches in line *9?*"

"There are four inches."

"In line *10?*

"There are six inches."

"Each one of these six inches is what part of the whole line?"

"Each one is one sixth of the whole line."

"Then line *9* is what part of line *10*?"

"It is four sixths."

"What, then, is the ratio of line *9* to *10*?"

"It is four sixths."

"What is the ratio of four inches to six inches?" "Of four apples to six apples?" "Of four cents to six cents?"

"Now, we say that the ratio of line *10* to line *9* is six fourths. Who sees the reason for that?"

"Because to make line *10* out of line *9* we must take line *9*, or four fourths, and two fourths more, making six fourths."

"Who can tell the two ratios of lines *11* and *12*?"

"The ratio of line *11* to line *12* is three fourths. The ratio of line *12* to line *11* is four thirds."

"Tell me again the ratio of line *1* to line *2*."

"One half."

"Of line *2* to line *1*."

"Two."

"Suppose that each little line means a stick of candy. If these four sticks of candy can be bought for four cents, for how many cents can I buy two sticks?"

"For two cents."

"If four cents buy eight pencils, how many will two cents buy?"

"They will buy four."

"If two cents buy four marbles, how many will four cents buy?"

"They will buy eight marbles."

"Look at lines *5* and *6* and tell me the ratio of two inches to six inches." "Of six inches to two inches." "Of two marbles to six marbles." "Of six marbles to two marbles."

"If two marbles cost ten cents, what will six marbles cost?"

"They will cost thirty cents."

"If six marbles may be bought for twelve cents, for what can I buy two marbles?"

The teacher should give many other similar problems. Problems involving the ratio four sixths will be more difficult, but if small numbers are used at first, the children will readily take up the work. By drawing the line of six inches again and dividing it into thirds, the children will recognize four sixths as two thirds and six fourths as three halves. Continue the work until the children thoroughly understand this kind of problem.

5. **Written Work.**—As the children advance in school work, more and more written work should be done. A good deal of simple work can be done as seat work, or busy work, as it is often called. Tables of multiplication and division may be formed, simple number stories written, problems on the board solved or original drawings made to illustrate number facts. These papers should be carefully looked over and returned with the mistakes marked. A good many teachers get into the habit of demanding considerable written work which is consigned to the waste basket without being looked over. This practice leads to careless work, for the children, knowing that their work will not be corrected, naturally do not try to do their best. A capable, older pupil may often be entrusted with this work of looking over papers if the teacher is very busy. The teacher should see to it, however, that this pupil does her work carefully and conscientiously.

6. **Decimals.**—Decimal fractions, if properly taken up, do not prove difficult for most children. The following will illustrate one way in which the work may be commenced: The teacher informs the class that they are going to learn

about a new kind of fractions. She then asks the question, "Robert, fifty cents is what part of a dollar?"

"It is one half of a dollar."

"How many one-hundredths of a dollar is it?"

"It is fifty one-hundredths."

The teacher writes: 50¢ = $\frac{50}{100}$. "Now we will write it another way, using the dollar sign." The teacher then explains that the decimal point must be written before every decimal fraction. $ .50 is written at the right of $\frac{50}{100}$.

"Mary, write forty-five cents in these three ways."

"Write seventy-five cents, Ruth."

"Class, read this number." (The teacher writes $1.55.)

"Of what use is the decimal point?"

"It separates the cents from the dollars."

"How many cents are there in that sum?"

"There are fifty-five cents."

"In fifty-five cents, how many tens?"

"There are five tens and five cents more."

"Here, now, is one thing we must remember. The first number which follows the decimal point means tenths. In this number ($1.55) the first five means five tenths of a dollar. In these numbers tell me how many tenths of a dollar."

$ .25
.69
.87
.40

$1.53
4.28
3.07
1.03

The tenths are given.

"In $ .55 you said there were five tenths and five cents more. Now this five cents that is left is what part of a whole dollar?"

"It is five one-hundredths."

"Let us write it in three ways."

'It is written thus: 5¢, $\frac{5}{100}$, $ .05."

"Write six cents in three ways." "Seven cents." "Eight cents." "Ten cents."

"Here, then, is something else to remember. The second figure after the decimal point means hundredths. Now read these same numbers and tell the hundredths in each case."

"Now how shall we write a decimal fraction that does not contain tenths?"

If no one knows, the teacher explains.

"When we first began, you said that fifty cents equals fifty one-hundredths of a dollar. Twenty-five cents is how many hundredths of a dollar?"

"It is twenty-five hundredths."

"Read these same numbers as so many hundredths of a dollar."

The numbers are read, the dollars being omitted in the second column.

"If I write five tenths of a dollar thus (writing .5), how shall I write five tenths of a bushel?" "Five tenths of a foot?" "Five tenths of anything?"

"If three hundredths of a dollar is written .03, how shall we write three hundredths of anything?"

"How shall we write twenty-five hundredths?" "Sixty-five hundredths?"

Plenty of practice in reading and writing decimals is given and problems in addition and subtraction are solved until the children are perfectly familiar with the two places following the decimal point. In a later lesson it should be brought out that 1.2 may be read one and two tenths or twelve tenths; 3.7 as three and seven tenths or thirty-seven tenths. Do not introduce this too soon, for fear of confusing the children.

Lack of space forbids treatment of all of the various phases of number work, but with the suggestions made, with a careful study of good books on number work, with the help to be found in educational magazines, and with personal ingenuity, a teacher should be able to make of number work a most delightful study.

She should bear in mind that to be successful in teaching any subject, she must have a definite end in view and constantly work toward this end. Disjointed, spasmodic work bears little fruit. It is the steady, patient striving to accomplish a certain purpose that counts. Furthermore, it is absolutely essential that the teacher have a good grasp of the topics she expects to cover in a certain term. She should not teach from day to day, as it were, taking up decimals to-day and not knowing what is coming to-morrow. She should know thoroughly the whole field of work and make the lessons of one day pave the way for the lessons of the next.

TEST QUESTIONS

1. How early in the third year would you place the arithmetic in the hands of the pupils? Give your reasons for your answer.

2. To what extent should the teacher study a primary arithmetic before placing it in the hands of the class? Why should the teacher keep more than a lesson or two ahead of the class in any text-book?

3. Give reasons for the introduction of such lessons as that on the reduction of denominate numbers in the third year's work. What is the relative value of concrete and abstract problems in this year's work?

4. Give the outline of an illustrative lesson that you would use to show the reductions in linear measure.

5. Should the pupils memorize the definitions and rules found in the arithmetic? Why?

6. How can strips of paper be used to illustrate the lesson on addition of fractions? State how you would have the paper prepared, and how the pupils should use it.

7. Outline an illustrative lesson for teaching the subtraction of fractions.

8. Would you introduce multiplication and division of fractions during the third year? Why?

9. What relation do you find between the lesson on addition of fractions and that on proportion? Which do you consider the more difficult to the pupils? Why?

10. What are the advantages arising from the introduction of decimal fractions into the third year's work? Why do pupils in the higher grades usually find decimals so difficult?

INNOCENCE

LESSON THIRTEEN

SENSE-TRAINING

1. The Function of the Senses.—The child gets all his primary ideas of the external world through the action of the special senses. Indeed, the special senses may be called the idea-gatherers, the indispensable servants of the brain. The senses not only gather ideas of the material world for the brain, but they also constantly stimulate the mind to lay hold of these ideas and, through thought activity, to relate them properly one to the other, gradually classifying and storing them away for future use.

But in childhood thought power is only in its dawning. It is weak and unformed. Here, as elsewhere, growth and strength come from exercise, and it is the sensory system that spurs thought to effort. Were the stimulating power of the senses wholly and forever removed from the brain, the mind would be left in darkness and never develop into the usefulness possible under normal conditions.

Unfortunately, we have only to look about us, to study the ordinary acts and conversation of children and of adults as well, to find that in a great majority of cases the senses do their work so poorly that few individuals can be trusted to give from memory an accurate description of the simplest object or act. The statements of many people are unreliable because their perceptive powers, from lack of training, are not able to give reliable information. For these and many other reasons the special senses should have systematic, continuous and well-digested training during the years when the child's organism is in the plastic condition that makes it easy to receive and retain impressions.

2. **Underlying Principles.**—That the teacher may be successful in the work of sense-training, she needs to understand the following underlying laws and principles:

(*a*) DEVELOPMENT OF THE SENSE-ORGANS. At the age at which the child enters school his senses are keen, but the organs of special sense are not fully developed; therefore, the pupils of primary grades should not be given exercises requiring too fine distinctions in color, form or measurement. At first only simple objects should be used and observation of the most prominent features only should be required.

(*b*) THE FUNCTIONS OF EACH SENSE. Each set of sense-organs conveys to the mind ideas peculiar to themselves and which primarily cannot be conveyed through any other channels. A person born blind never has an idea of color, and one born deaf never has an idea of sound. Some blind people form apparent exceptions to this, but in every instance these people became blind after birth, and, after their misfortune, relied upon their past experiences.

(*c*) ALL THE SENSES MUST BE TRAINED. To train some senses and neglect others is to give the child a one-sided mental development, because each sense contributes something to his store of knowledge which none of the others can supply. This principle should constantly be kept in mind, since the sense of sight is more easily trained than any other, and teachers are prone to give too much attention to sight training, to the neglect of hearing, touch, taste and smell. Primary knowledge obtained through the eye alone is incomplete, and children who are never trained to use all the senses possible in acquiring knowledge become superficial observers and fail to acquire the power to think clearly or judge correctly.

(*d*) PROPER PHYSICAL CONDITIONS. The senses are keenest when the system is in an unwearied condition. This keenness is dulled by general fatigue or a prolonged use of the special organ. An odor which at first is disagreeable is soon tolerated, and a little later scarcely noticed. Water which feels hot when the hand is first plunged into it, seems to cool quickly because the sense of touch has become accustomed to the temperature. Nervous diseases often irritate the organs of special sense and lead to abnormal activity. Sometimes, in children of nervous temperament, some of these organs are abnormally sensitive; a slight sound causes the child to jump, and a touch to which others would give little heed produces pain. Such children should be watched very carefully to see that their senses are not unduly excited by any school exercise.

Exercises in sense-training should not be given when the children are tired or immediately after they have come in from vigorous outdoor exercise.

3. Relation of Sense-Training to Perception.—Ideas are obtained through the senses only when one becomes conscious of his sensations, and the mind reacts upon the impressions conveyed to it and forms a judgment. These judgments may be expressed as, "The object is an apple," "This color is red," "The orange is sweet." The conditions essential to securing satisfactory results from lessons in sense-training are:

(1) The impression must be strong enough to secure the attention of the pupils.

(2) A judgment must be formed by the pupil. He must decide what the object is or is not. To do this he must compare the idea presented with ideas already in his mind, and determine to what extent it agrees or disagrees with them. This process requires time, and the formation of hasty judgments concerning unfamiliar objects should be discouraged.

(3) Repetition is necessary. If the ideas formed in childhood are to be of value in after life they must be accurate. Those obtained from a single impression are incomplete and the exercise will need to be repeated again and again before complete and accurate ideas are obtained. If these repetitions are so conducted as to hold the attention of the pupils, they lead to the formation of habits of careful observation which in after years enable the pupils to discern nice distinctions, as in matching delicate tints, tuning musical instruments and determining the quality of a fabric by the sense of touch.

4. Length of Lessons.—During the first year, the lessons given expressly for the training of the senses should never exceed five minutes each. The exercises are of little value unless attention and concentration are at their greatest intensity, and children of but five or six years of age should not be subjected to such a mental strain for more than five minutes at a time; otherwise the nervous system may be seriously injured.

In the second year, the time may be increased, but not greatly; and even in the third year, the time should never be prolonged beyond ten minutes.

Interest must be kept at a high pitch all through the lesson, in order to deepen the impression desired and to reduce the conscious work of the memory to the minimum. Thought and action must also be rapid or interest will flag. In all the early exercises, the order should be observation, imitation, correction, repetition for accuracy.

Cautions. 1. Every impression must be made clear, sharp and vivid, in order that it may be easily retained. These conditions depend almost wholly upon the depth of interest aroused and maintained; therefore, never prolong the exercise after the interest for any reason begins to fail. Adhere to this rule rigidly, filling out the period with a brisk march or an inspiring song for the purpose of relaxing the tension of the nerves.

2. Interest depends upon the skill and preparation of the teacher; therefore, never attempt to give one of these lessons until the end sought is clearly in mind and the lesson fully prepared.

5. **When to Give the Lessons.**—It is not necessary in any grade of school to have a separate period marked upon the program for sense-training. The teacher should keep sense-training definitely in mind and arrange the lessons in number, reading, nature study, writing, spelling, phonics, drawing and all other regular school subjects in such a way that one or more of the senses will receive definite training from each lesson. This must come as an incident to the regular lesson and not be made prominent enough to divert the mind from the main issue of the recitation.

Occasionally, use the time regularly given to phonics for a lesson in sense-training. At another time, when a general defect in sense perception has shown itself in the class, prepare a lesson on purpose to correct this defect and give it in the time usually allotted to mental arithmetic, having all the school participate, if possible. Again, much valuable training may be given during recesses or a part of the noontime when a considerable number of pupils have brought their dinners, and, because of unfavorable weather conditions, cannot play outdoors. In the last instance, the teacher should have the exercises prepared in advance. Sometimes she may lead, but as a rule it is better to let the pupils conduct the exercises. She will be present to act as referee in case one is needed. Make the lesson an interesting game.

The pupils will enjoy these sense-training exercises better and get more out of them if they come in the form of games, quite different from a regular school exercise. The games should be full of activity, much diversified, and often provocative of merriment. Then there will be complete relaxation, bringing a rest next to that derived from outdoor games.

The teacher should, however, see that the fun does not amount to boisterousness nor the activities degenerate into rudeness. There is a certain degree of decorum due to the schoolroom that should never be lost sight of. It need not be so great as to shut out harmless fun, and yet it should be sufficient to prevent whatever is objectionable in speech or deportment.

What has just been said in regard to the time for giving lessons in sense-training applies particularly to rural schools and to such as are but loosely graded. In the closely graded schools of the cities there is but one grade in a room and every lesson or exercise of a general nature includes all the pupils of the room. In such schools, it is practicable and desirable to set apart from five to ten minutes on the daily program for the specific training of the special senses.

When proper attention is given to sense-training during the first three years of a child's school life, there should not be much need thereafter of separate lessons for this purpose. Beyond the third year, if the previous opportunities have been wisely used, the special senses can be kept alert and trustworthy by planning the regular lessons of each day in such a manner as to call the several senses into varied and constant activity. This will add new interest to the lessons themselves and render the pupils more quickly responsive to the teaching in all subjects.

6. Preparing the Lessons.—In the preparation of each lesson of the day, the teacher should decide upon a certain thing to be taught during that lesson. She should also determine what faculties of the mind need to be called into activity and how this is to be accomplished. Thirdly, she needs to decide which of the special senses will best aid the pupil to comprehend and retain the lesson decided upon and what illustrations, questions and requirements will bring those senses fully into activity during the recitation.

Preparing lessons in this closely analytic fashion is, at first, difficult and tedious. However, by perseverance, the mind soon becomes accustomed to working in a systematic fashion and the mental habit acquired is of incalculable value to the teacher and the pupil. It saves time, develops quick and accurate sense-perceptions, strengthens all the mental powers, and makes it possible to think with surprising clearness and rapidity both in and out of school.

Caution. While something can be accomplished in sense-training by means of desultory work given at odd moments, far more can be accomplished by regular, systematic, carefully-prepared lessons. When the time is limited there is all the more need that each exercise have a definite purpose, be systematically prepared and given with animated earnestness.

7. Immediate Results.—Sense-training is not a fad of modern education, and no teacher should so consider it. In the days of our forefathers, when books were scarce, all relied more upon their powers of observation and less upon books than at the present time. Because of this condition, special lessons in sense-training were not needed in the schools of that day as they are now, and this is the principal reason for the emphasis placed upon these exercises in modern works of education.

By means of systematic sense-training every child in the room may, and should, be fully aroused physically and mentally. There is no better way to get a child quickly into the right receptive condition and make him keenly awake to all that goes on around him. By no other means can the seemingly dull children be so soon changed into bright scholars, alert in every sense and ready to receive and digest the intellectual food daily presented. Moreover, the senses must be trained properly or mental growth will be slow and unreliable.

These truths have always been accepted by the most successful teachers of children. These teachers may have said little in theory, but they have demonstrated their faith in their practice. Among them, Pestalozzi and Col. Francis W. Parker were notable examples, and thousands of less noted primary teachers have followed the same course. Without saying a word about "sense-training," they have, nevertheless, both consciously and unconsciously, trained the senses.

The more remote methods of work in this line were often crude and insufficient, because no one had definitely thought out the subject in all its bearings upon the elementary education of the child. Now there are reliable statistics and well formulated data to serve as guides for young teachers. There are, also, methods and devices of value that have been evolved from actual work with children at school and at home.

Many exercises and games suitable to use in primary grades will be given in this lesson. Some are arranged as lessons to be taught regularly like other lessons. Some are in the form of games to be used at recess or noontime or as recreation exercises out of school. There are others that may be given in connection with spelling, reading, number, or other lesson. These latter are not to be "tacked on" to a lesson, but are to be interwoven with it and made a part of it.

It will take but a brief examination to show which sense is made most prominent in any lesson or exercise. Neither will it take any argument to prove that impressions are deepened by bringing more than one sense into activity at the same time.

Cautions. 1. Here, as always with methods and devices, the intention is to suggest, not to limit.

2. Select such as best meet the needs of your own school, bearing in mind that the needs must be determined by testing the sense-activity of individual pupils.

3. Keep the underlying purpose clearly in mind and adapt the exercises to fit the conditions of your school.

4. Make new exercises and encourage your pupils to do so.

8. **Suit Work to the Conditions.**—Schools and classes greatly vary in regard to the action of the senses, and individual cases vary still more. Some pupils will be found curiously "eye-minded," and see more quickly and accurately than their classmates; others are distinctly deficient in visualization, but are strongly "ear-minded." These can detect and analyze sounds that the other children frequently do not hear. Some children will be discovered who are almost devoid of the sense of smell, and others will be found who are deficient in the sense of taste. Some will discern minute differences by the sense of touch; others have little or no power in this line.

These differences are detected by observation and by direct tests. Much of the training must be corrective in character and will entail a great deal of work with individual children or with groups having similar deficiencies.

Aside from the cases where the sense-action is below normal, all children need definite sense-training for the purpose of developing and strengthening their natural powers. Not only must the senses act accurately; they must act quickly as well. If they do not, then they fail to render the best service and so show the need of training.

On entering a new school or on receiving new pupils, the teacher should watch the children carefully to detect any defects in sight or hearing. Defective children are usually timid and more sensitive than the others. Neither the child nor his parents may realize the difficulty under which he labors. An optician's card for testing the eyes can be procured for a few cents and should form a part of the teacher's outfit, unless she is in a system of schools where the superintendent or principal is provided with appliances for testing the eyes of children. To test a child for defective vision, place the card in a good light and seat the child in front of it, twenty feet distant. Place a card over one of the pupil's eyes, but tell him to keep both eyes open, and name the letters, beginning with the largest and passing successively to the smaller sizes of type as long as he can distinguish them. If he cannot read without hesitation letters which the normal child should see easily at a distance of twenty feet, take the next largest type that he can read; notice the distance at which it should be read by the normal eye. Repeat the experiment with the other eye. The child's parents should then be informed of the result of your test. This will usually lead to his receiving the needed attention. A child's acuteness of hearing can be roughly tested by noticing the distance at which he can hear a watch tick. These tests should be made when no other children are present and should be so conducted as to relieve the child of all embarrassment.

9. **Language and Sense-Training.** — Language is very largely dependent upon the stimulation received from the action of the special senses. In the first five or six years of a child's life the spoken vocabulary grows with remarkable rapidity. During these years sense-action predominates over all others. It continually calls the child's attention to new objects, qualities or conditions in the world around him, stimulates interest and curiosity about these, and brings forth the ever recurrent "why?" "what?" and "what for?", the answers to which add new words to the child's list in almost incredible numbers.

10. Exercises to Train the Visual Sense (Sight).—To train the visual sense and develop the power of quick as well as accurate observation, use the following suggestions:

(1) Place three or four simple, unlike objects upon a table, ask the class to observe them for an instant and then to turn away or cover their eyes. Disarrange the objects very quickly and quietly; tell the class to look and then call upon some child to reproduce the first arrangement. Let the class observe the work, criticise and correct it, reserving your criticism of unnoticed errors to the last.

(2) Give the same exercise with more objects; limit the number to ten.

(3) Modify the exercise by having one of the children arrange and disarrange the objects.

(4) Perform a series of simple, disassociated acts, only three or four at first, while the class observe. Then ask one child to reproduce the acts in the same order and the same manner, while the other children observe, criticise and correct.

(5) Conduct a similar exercise with more acts in a series. Do not make the series too long.

(6) Modify the exercise by having some child serve as leader and perform the acts.

(7) While the children have their eyes covered or their faces turned away, place a number of dissimilar objects upon a table. Permit the class to observe the adjustment for about one minute, then quickly cover the objects and ask the class to take their pencils and write the names of all the objects. Care should be taken to prevent any grouping that will suggest the arrangement by the law of association. Make the time of observation short, no matter how many objects are used. Do not uncover the objects until the writing is complete, and then verify the list. The time for writing should be limited, or the mental action will be slow.

(8) Modify the last exercise by using objects of different colors and asking the children to write the names of the colors.

(9) Give an exercise similar to (7), but use objects of different forms, such as triangles, prisms, etc., as many as possible.

(10) Give a similar exercise, but use pictures of animals (cut from circus posters, old geographies, old readers and periodicals and pasted upon cardboard or stiff paper).

(11) Show a bar or line of music and, after a moment's observation by the class, cover it, asking the children to reproduce the notes. Verify the result. Limit the time sharply in all these exercises, or there will be slow perception and memory.

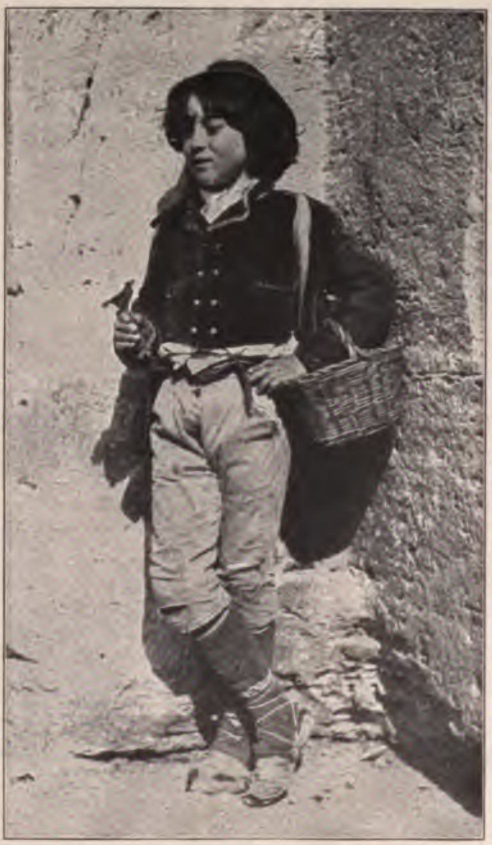
(12) Suddenly uncover a group of miscellaneous words which you have previously written upon the blackboard. Ask the class to observe for a moment and then close their eyes. Erase one of the words and ask the class to tell what word was erased. Act quickly.

(13) Give a similar exercise, but have the children do all the work.

(14) Give a similar exercise in which the children tell which object of a miscellaneous group is removed.

(15) Have a class of little children use the following exercise: Arrange the children in a ring and, while the eyes of all are closed, place one of the children behind you. Ask the class to open their eyes and tell instantly who is missing. Vary the exercise by sending one child from the room and requiring him to tell when he returns what child is missing from the ring. The ring must be closed each time a child steps out.

(16) If you have a collection of flags of different nations, ask the children to observe carefully the position of each. Then, when they have closed their eyes, remove one; ask the



A ROMAN FLOWER BOY
A photograph from life.

class to open their eyes and name the one removed. With older pupils vary the exercise by asking a pupil to observe one flag intently, then close his eyes, name and describe the flag, while the class with open eyes criticise.

(17) Let the children observe the pictures in the room and then close their eyes, while you ask, "What picture is on the east wall?"; "What is over the center of the north wall?"; "To the right of you?"; "To the left?" Modify the exercise by asking the children to close their eyes and locate the pupils, saying, "Mary stands by the east wall," and so forth.

(18) Place a doll or one of the children in front of the class. After the class have observed for a moment, require them with closed eyes to describe the hair, eyes, clothing, being very particular to have the colors named exactly. Verify.

(19) Place several unrelated objects before the class. After they have observed for an instant, ask them to close their eyes and answer such questions as the following: "Name all the objects on the table;" "What is on the upper right-hand corner?" "Lower left-hand corner?" "Nearest the front edge?" "Nearest the back edge?" "On the lower right-hand corner?" "On the upper left-hand corner?" "To the right of the prisms?" "To the left of the bell?" "Behind the book?" "In front of the eraser?" Call on different pupils to answer these questions.

(20) Write very rapidly a group of names on the blackboard, the class observing. When they have closed their eyes, erase a word and have them tell what name is gone. Modify the exercise by using figures instead of names.

(21) Stand ten pupils in a line. Let the others observe, close their eyes and name the pupils in order, commencing at the head of the row. Then, with eyes still closed, name them, beginning with the foot. Change the position of two

or more. Extend this game to exact statements; as, "Mary stands at the left of Henry and right of John"; "Frank is at the right of Henry and left of Sarah."

If the above exercise is applied to outline forms drawn upon the board, to objects around the room or objects purposely arranged for the drill, a great diversity is possible.

(22) Show quickly cards having phonograms. Remove them instantly and have the class name what was seen. Vary this by having them give the sounds or by having a pupil pass to the board and write the phonograms. Apply this exercise to simple outline drawings which you show for an instant and then require the pupils to draw from memory.

(23) Show for an instant one of several number blocks which you have at hand. "Find one that is equal to two like this." "Find one that is one-half of this."

(24) Build quickly a simple design with blocks. Scatter the blocks and ask a child to rebuild your design. Let the class criticise.

(25) Arrange a group of cubes, prisms and other "form" blocks of different colors. After the children have observed an instant, scatter the blocks and ask the class to make a group exactly like the first.

(26) Call the children around the table. Have them find, show and name things from your rapid descriptions; as, "Find the block that rolls in all directions"; "Find a prism having all its faces square." This exercise you may vary in many ways to sustain interest.

(27) Distribute small sticks or toothpicks. Make rapidly an outline drawing on the board. When the class have observed it, erase it and ask them to reproduce the outline with sticks. See how many can be made in five minutes.

(28) Ask the children to name everything in the room or elsewhere that is like an oblong, a square, a circle, a cylinder, a sphere. See who can name the most.

(29) Apply the same plan to different colors in fruits, flowers, vegetables, clothing and miscellaneous articles of all kinds.

(30) Encourage the children to judge of the comparative and actual lengths of horizontal and vertical lines drawn upon the board; compare horizontal with slanting lines, etc. Prove each case by actual measurement.

(31) Present inch, foot and yard measures. Let the class observe a moment and then, unaided, draw lines of the same length. Criticise and prove the lengths. Gradually extend the length of the lines to two feet, two yards, etc.

(32) Present packages and boxes of different sizes to the class and ask such questions as: "How long a string is needed to go around this box each way and tie in a hard knot, leaving ends an inch long?"

(33) Ask the children to do various things in pantomime, and let the class tell what is represented; as, "Anna is cleaning house"; "Frank is flying a kite"; "Helen is ironing"; "Susie is washing"; "Joe is pumping water." This is a highly interesting exercise and the children will soon become expert enough to dramatize the leading facts of a simple story, fable or poem in a similar manner.

(34) Place a number of objects upon the table and have a child name and show the object from the description which you give. For example: "I am thinking of something that is yellow, shaped like a long cone, and is used as food." (Carrot.) "I wish something that is red, round, juicy and good to eat." (Apple.)

(35) Write a number of adjectives describing color, form, qualities. "Helen may erase the word that tells the color of the sky on a clear day." (Blue.) "Charlie may erase the word that tells the color of Henry's tie." "Julia may erase the word that tells the shape of an orange." "Della may erase the word that tells the taste of sugar," etc.

The above is very helpful as a quick and interesting drill on words. It may be used in a great variety of ways; as, "Erase the word that tells what I do now" (laugh, run, walk, etc., etc.). "Erase the name of the insect that buzzes loud," "the animal afraid of the cat," etc. Have the child name the word each time before he erases, to prevent mistakes.[1]

Cautions. 1. In nearly all the exercises in visualization, the time given is so brief that the impression is merely a flashlight picture upon the retina and probably would not be retained by the memory but for the intense interest and the rapid work. The focus of the eye is so rapidly and constantly changed that it is dangerous to the sight to prolong the exercise for more than a brief period. Watch carefully for any signs of eye-strain or weariness.

2. Make the diversity endless by adaptation and by changing methods of presentation.

3. Note carefully the degrees of difficulty, selecting the simplest and briefest exercises for the primary pupils. Encourage the older pupils to make use of the more difficult exercises for recreation and entertainment at informal evening parties, noon-time occasions, etc.

11. Exercises to Train the Hearing.—(1) Place bells of various kinds and sizes upon the table before the class. Let the children inspect and name the bells. Get the attention of all; ring each bell separately; have the children tell which was rung. This part of the exercise is to teach them to associate tones with the bells producing them. Have the class close their eyes. Ring one bell. Ask the children to tell which one was rung and then have them verify each answer with their eyes open.

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[1] We shall purposely omit many devices and games for the training of the senses, knowing that it is better to leave something for the teacher's own ingenuity to work out. What have been given are typical and suggestive, not exhaustive and not restrictive. Many of the exercises are imitative, others require a good deal of originality. All demand the closest attention and rapid work in order to be really valuable.

(2) Modify the preceding exercise by requiring the children to do all the work. Use your ingenuity in readjusting the bells while the class have their eyes closed. You must work silently, or the children will detect the changes.

(3) Give a similar exercise with the class across the room from the bells, so that they may judge the sounds from a distance.

(4) Divide the class into two parts and place one across the room from the other. While one side close their eyes, silently indicate a child on the other side to sing a musical tone. The pupils with closed eyes tell which pupil sang. Let the other side close their eyes and you select a singer from the first side. You may increase the interest and attention by keeping tally to see which side is the more accurate.

(5) Choose sides as in the preceding exercise. Sing any note of the scale and call upon the children to go to the board and write the note sung in its proper place upon the staff which you have previously drawn upon the board. This will give interest to the music and you can keep tally to see which side excels.

(6) Vary exercise (4) by having the pupil laugh instead of sing. This is a good exercise on a stormy, gloomy day when the children need relaxation and recreation. Only two or three minutes need be consumed.

(7) You may modify exercise (5) by singing the tones so that as the children write the notes a simple melody is composed. Have the class keep close watch, correct errors and at the end unite in singing the melody.

(8) After considerable skill has been attained, class may be taught to distinguish church bells, school bells, factory whistles, etc., describing the sound made by each, and recognizing each by name as soon as sound is heard. This must

be, necessarily, an out-of-school exercise or at a time of year when doors and windows are open. Descriptions can be given in school and verifications made from the descriptions.

(9) Have the children learn to distinguish and locate different doors, gates and windows by the sound made when they opened or shut. Also teach recognition of voices, footsteps, the striking of different clocks, the ticking of different watches, etc. Encourage the practice of these games at home or anywhere outside of the schoolroom. Their practical value is very great, for few people make as much use of the sense of hearing as they might and should do.

(10) Call a child to the front, play a marching tune and after a minute change it to a skipping tune. Let the child follow the movement of the tune. Vary this exercise by playing a simple medley of familiar songs in which the child's singing follows your changes. This exercise may fill the time of an indoor recess by calling out many different children and at last having all join in following the exercises or the singing.

(11) Train children to distinguish between sounds emitted by different substances when they are struck with the same instrument and the same force. Use objects made of wood, iron, lead, glass, stone, etc. Follow plans of preceding exercises.

(12 and 13) Two number games given by the *Connecticut School Journal* are as follows:

"As a review device, the teacher asks a child to close his eyes while a second child claps a certain number of times. For instance, four claps are given four successive times, and the one who has hidden his eyes guesses four fours. This may be continued several minutes without lagging of interest, because every one covets the privilege of closing eyes. Here is proof again of an old pedagogical truth, that whenever action is brought into play interest is sustained. Children like to do things.

"A second device, even more pleasing than the former, is one in which the entire school participates. A child comes to the front of the room and hides his face. The teacher then indicates with a nod or the finger some other child, who stands and counts by threes to thirty. Of course, any number may be selected. The one whose face is hidden guesses the name of the child who counts. Much interest is shown and several mistakes in guessing prove that sound is not always associated with the object to which it belongs. To keep an entire class interested during counting drills is not so simple as it seems, but here is one device that is welcomed by children and always keeps them alive."

(14) Place several children in various parts of the room. As each child asks in turn, "Where am I?", call upon some pupil in his seat to answer, naming and locating the questioner; as, "Helen Abbott is on the east side of the room"; "Will Smith is in the northeast corner," etc. When all have spoken, the pupils in their seats, who in the meantime have kept their eyes closed, should open them and verify what has been said.

(15) Ask the entire school to close their eyes. Perform several unrelated acts in rapid succession; as, the ringing of a bell, the opening and closing of a door, the humming of a tune, etc. Then ask the children to open their eyes and describe or imitate the acts in the same order in which you performed them.

(16) Ask the class to close their eyes. Strike the bell six times. Tell the pupils to open their eyes. Then say, "Mary, go to the board and make marks to show how many times the bell was struck." Sometimes have them clap hands, tap with a pencil or pointer or stamp their feet lightly to show how many times the bell was struck.

(17) Give the sound of some letter or ask a child to do so. Let the class name the letter or write its phonogram upon the board. Extend this exercise to include the spelling of words and short sentences, having the class verify as before.

(18) While the school close their eyes, drop a heavy block one foot, and then four or five feet. Let the class tell which time it fell farther, judging from the sound.

(19) Utter rapidly a number of names and require any one of the class to give the same names in the same order. Vary this by making the list longer and by uttering disassociated sounds; as, a musical note, the sound made by some animal, a whistle, a laugh, the sound of a letter, etc.

(20) Call four or five pupils to the front and have the rest of the class sit with closed eyes. Let those in front speak or imitate some sound while the class with closed eyes report: "Nellie sang"; "Frank laughed"; "Flora said, 'It is a fine day' "; "Charlie barked like a dog"; "Harry said, 'How do you do?' "

(21) Call three or four children to the front to perform certain acts, which the rest of the class, with closed eyes, detect by sound and report as follows: "Mary ran to the door"; "John walked north"; "Nellie jumped the rope."

(22) Place together a number of objects of different materials, such as a bell, a glass bottle, a tin cup, a wooden cube, etc. While the class sit with closed eyes, strike an object with a nail, for instance. Let the children tell what object was struck, from the sound emitted. Do not permit guessing. Train the hearing by striking the objects a number of times before the children close their eyes. By using a large number of objects this may be made a very difficult exercise.

(23) Vary the preceding exercise by having one pupil whittle different things, as, a pine stick, a slate pencil or chalk, while the pupils with closed eyes tell by the sound alone what was whittled.

Caution. Always insist upon perfect attention, keep the children working briskly, every faculty alert, and stop the moment you see signs of weariness or flagging interest.

12. The Senses of Taste and Smell.—These two senses being so closely related, it is claimed by some that one cannot be fully separated from the other in actual experience. However that may be, it is certain that these two senses, by judicious training, may be made to minister much more fully to one's usefulness and happiness than they do in general at the present time.

(*a*) SENSE OF TASTE. If the sense of taste is not abused, it may serve to guard the system from poisonous or harmful substances by detecting mould, mustiness or whatever may be unusual and undesirable in food and injurious to the system. It also enhances the pleasure of eating, by detecting at once the delicate flavors in food and drink. In the case of the tea-taster and wine-taster, this sense is the source of his livelihood and is never abused. To the cook, also, a delicate and accurate sense of taste is indispensable. Time is not wasted, therefore, in giving exercises in training the taste to distinguish the proper values of salt, pepper, all kinds of spices, flavors and other articles of food and drink in common use.

(*b*) HOW TO TRAIN THE SENSE OF TASTE. The law of association should be used constantly to render the taste memory able to recall what it ought to know in ordinary times or in cases of emergency. Hence, many exercises should be given with all kinds of articles of food, the pupils being permitted to see the articles and to handle them freely before tasting them. Use only one kind at a time during the first lessons, teach the name and train the taste to recognize each and to distinguish marked differences in flavor; as, "This apple is sour"; "This apple is sweet"; "This apple is not very sweet and not very sour"; "This orange is sweet";

"This orange is sour"; "This pickle is sweet"; "This is a sour pickle."

After the examination of a great many articles (in different lessons) gradually lead the pupils to classify according to flavors; as, "Sugar, candy, syrup, licorice, Florida oranges, Delaware grapes, honey, pound sweets and bananas are sweet"; "Lemons, grape fruit, vinegar, most pickles, unripe persimmons, pie-plant, cranberries and green apples are sour"; "Pepper, cinnamon, cloves, allspice, nutmeg, mace, nasturtium stems and ends have a biting, pungent taste."

Other articles may be classified as pleasant, wholesome, sweet, bitter, fresh, dry, unwholesome, savory, unsavory.

Ask the children to close their eyes and open their mouths. On the tongue of each place a small quantity of some article of food. One reports, "I had honey"; another says, "I had cinnamon"; another, "Licorice"; another, "Carrot"; another, "Onion"; another, "Vinegar"; another, "Sweet apple." To be able to name such special articles by taste alone is a high accomplishment and it must not be expected that children can learn to do so without considerable training.

More difficult still is it to differentiate and to name at once any article of a group by means of the taste alone; as, to recognize without sight or touch a Bartlett pear from other pears; a Spitzenberg apple from other apples; English breakfast tea from other teas; pure Java coffee from other coffee; a hickory nut from other nuts, is indeed an accomplishment. But physicians, chemists, druggists and nurses learn to discriminate between different medicines and become able to name at once by taste alone those in frequent use.

Cautions. 1. Do not force these classifications too rapidly. They will come easily as children grow older and have more experience. Always provide receptacles for tasted articles and do not permit many things to be swallowed by the pupils.

2. In some of the more difficult classifications the other senses will need to coöperate, especially sight and smell.

3. Spices and condiments should be used very sparingly in these exercises, because they are injurious, and also because their frequent use may lead some of the children to acquire the habit of eating them.

(c) THE SENSE OF SMELL. The sense of smell is even more important than the sense of taste and may be made a still more valuable agent in preserving life and property from danger. Train this sense systematically to know accurately the proper odor of all articles of food, drink and articles necessary to the common purposes of life, and it will instantly and unerringly detect the slightest odor that is unusual or injurious and thus prove a safeguard against harm.

Articles burned, soiled, decayed, mildewed, etc., should be instantly detected by the sense of smell, as should also noxious gases, unhealthful vapors, etc.

Lessons in practical hygiene should form the basis and be the accompaniment of many of these lessons in training both smell and taste.

Here, again, the law of association will prove of the greatest assistance to the memory. Many of the lessons may be given according to the plans outlined for the lessons in taste. The order, also, should be the same, in general, as with the lessons in taste. Proceed from the known to the unknown. Strengthen the association of ideas at every point by using many devices and exercises to maintain interest. Keep in mind that few people realize to what an extent the sense of smell assists in the discharge of the ordinary affairs of life. This sense assists the grocer to know his vegetables and other commodities. By it the butcher can tell the state of his meats, the cook detect instantly anything wrong with the food she prepares, the chemist tell poisons from harmless substances, the lumberman name the kinds of lumber. The furrier, the tea and coffee merchant, and he who handles dry goods—all depend upon the sense of smell as much, or nearly as much, as upon touch or sight.

The sense of smell also adds much to our pleasure, as it is the agent by which we detect and enjoy aromas and perfumes and the odors of flowers.

For every reason, then, this sense should no longer be subject to neglect. On the contrary, it should be given careful, discriminating and systematic training, both in school and out.

13. Training the Sense of Touch.—The sense of touch is greatly improved by exercises in handling objects. This sense becomes marvelously acute in blind people and goes far towards making up for the loss of sight. To lend interest, tell the children stories of Helen Keller, Laura Bridgman and others deprived of sight. In the regular school routine, the work in number, form and in estimating weight may be greatly helped by exercises for cultivating accuracy of touch.

Lead children to observe blind people who may be in the neighborhood, for the purpose of determining to what extent they depend upon the sense of touch to replace the loss of sight; also, for the purpose of arousing such sympathy for the afflicted as will replace thoughtless acts of unkindness with sympathetic words and cordial helpfulness.

14. Suggestive Exercises.—(1) Place a number of objects of the same kind in the hands of children whose eyes are closed, and have each child tell how many he holds and then verify the number with open eyes.

(2) While the children keep their eyes still closed, take away from each one some of the objects he holds and let him

tell how many are left, how many are taken, and then verify his statement with open eyes.

(3) Modify this exercise by letting the children do all the work.

(4) Modify exercise (1) by using objects of various shapes and kinds and requiring the children to name the form.

(5) Modify (2) by working with objects of various shapes and kinds and requiring the forms to be described from touch alone.

(6) While half of the class close their eyes, present one child to them and have each find out who is presented by the sense of touch alone. Let the witnesses correct mistakes.

(7) Vary exercise (6) by using various objects, some familiar and some unfamiliar.

(8) Have the class, with eyes closed, tell by touch alone the materials of which objects are composed. Use first iron, glass, wood, etc., and later the fabrics such as silk, cotton, linen, satin, wool.

(9) Require the class to close their eyes and then place rapidly one or more objects upon each desk. Let the children examine and tell what object is left, keeping their eyes closed all the time; as, "I have a sphere"; "I have a cup"; "I have a cone"; "I have a lead pencil"; "I have a ball"; "I have a tablet"; "I have a two-inch square prism." Then have each verify his statement with open eyes.

(10) Vary the preceding by requiring the children to give as full descriptions as possible of the objects which they hold and then to verify with open eyes.

(11) Cover the table with form blocks. Blindfold a child and have him select the blocks you describe; as, "Find a block with equal surfaces"; "One with all straight edges"; "A triangular prism"; "A cone"; "An equilateral triangle"; "A hemisphere." The remainder of the class should watch carefully and correct mistakes.

(12) Vary the preceding exercise by having the pupil name and describe the block he has found.

(13) Cover the table with entirely dissimilar articles. Blindfold the child and let him select and name the objects as you direct; as, "Find a piece of charcoal"; "A piece of cheese"; "A glass ball"; "A pocket comb"; "A blackboard eraser"; "A piece of lead"; "An orange."

(14) Cover the table again with packages or articles of the same size but of different weights, and require the blindfolded child to select the heaviest; the lightest; those of the same weight; one that is one-half another in weight, etc. Make a great diversity in your requirements. After removing the bandage, verify the decisions, if possible, by using scales. Make the changes quickly and use as many pupils as possible. When you blindfold one child, have another standing ready to verify with the scales, and in other ways make every child feel he has a part in the exercise.

(15) Before the recitation, place different weights—the foot rule and yard stick; gill, pint and quart cups; quart and peck measures—upon a table and cover them carefully. Conduct a blindfolded child to the table, remove the cover from the measures and have the pupil select at random and name his selections.

(16) Vary the preceding exercise by using fruits, vegetables, articles for the dining table, and in other ways. Restrict the pupils always to the sense of touch. Do not allow them to see or smell or taste.

(17) Distribute sticks or narrow paper slips of different lengths to the pupils, who have previously closed their eyes. Let each child examine by touch and report as follows: "I have a slip two feet long"; "My stick is a yard long"; "I have a slip an inch long"; "I have a strip of paper one-half yard long." Afterwards let each verify his statement by actual measurement.

(18) Vary the preceding exercises by using strips of paper differing in width as well as in length, and ask the pupils to report both lengths and widths, verifying as before.

(19) Blindfold one child and place a doll in her hands. Require her to give a description from touch alone; as, "I have a doll with a china (bisque or wax) head, arms and feet; it has long hair in curls; the dress is soft wool, with a narrow ruffle at the neck, a silk sash, four buttons at the back and three narrow tucks and a hem at the bottom."

(20) Place a blindfolded child before the class. Quietly call another to the side of the first and have her describe the new-comer and if possible give her name. The pupils at their seats should watch everything carefully. After the bandage has been removed from the eyes of the first child, correct any errors that have been made in description.

(21) Call ten boys to the front of the room while the others look on. Ask the pupils to close their eyes. At a quiet signal have the ten rapidly and silently change places to make the grouping entirely different from that seen at first. Have all but one row open their eyes; then from the one row select a pupil, blindfold him and lead him to the front to name the ten pupils. This is really a valuable exercise and is an excellent one to use to fill a recreation period or on a stormy day when pupils are much in need of complete relaxation, because it causes much merriment and is greatly enjoyed.

Caution. It is well, quite frequently, to trust pupils to work without a bandage over the eyes, developing the sense of honor and fair play. At first use the bandage and gradually make the pupils self-reliant. Of course much more work can be done when time is not used for adjusting the bandages each time.

15. Where to Get Help in Sense-Training. Undoubtedly a careful study of the conditions and methods existing in the best schools for defective children would furnish greater help than can be obtained from any books.

The full story of the lives of Helen Keller, Laura Bridgman, and other notable cases of defective senses will convince the most skeptical of the value of this recently developed phase of education.

The high practical value of sense-training is also seen in work of tea and wine tasters, textile experts, the managers of flour mills, steel converters and in numerous other occupations where the skill of the operator is dependent upon the keenness of his sense of touch, sight or hearing.

Teachers will gain great benefit from a careful study of the following books, giving special attention to chapters eight to ten of the book by Halleck:

Halleck, Reuben Post, *Education of the Central Nervous System*, The Macmillan Company, Chicago	$1.00
Rooper, *Apperception, or, a Pot of Green Feathers*, C. W. Bardeen, Syracuse, N. Y.	.50
Lange, *Apperception*, translated by DeGarmo, D. C. Heath & Co., Chicago	1.00

16. Closing Words.—Teachers of rural or loosely graded schools should not attempt to set aside a separate period for sense-training. The time is too limited. Note carefully the suggestive exercises given and make first choice of those that can be combined with the regular lessons in phonics, number, form, nature study, elementary geography and language. Thus, the regular work of the program will not be interfered with, but new life will be imparted by planning to include sense-training in the other lessons.

The most valuable lessons in sense-training are those which the children receive through outdoor exercises. Direct them to observe the birds and animals in the locality, to study the trees and wild flowers, and to observe the constantly varying tints and changing cloud forms in the sky. Of exercises of this sort the English psychologist Sully says: "It is not to be forgotten that the best training of the observing powers lies outside the range of school exercises. A habit of close observation of nature is best acquired in friendly association with, and under the guidance of, an observant parent or tutor, in hours of leisure. A daily walk with a good observer will do more to develop the faculty than the most elaborate school exercises. The training of the observing powers is indeed that part of intellectual education that most requires the aid of other educators than the schoolmaster."

The lessons in hygiene will afford excellent opportunities for teaching the functions of the special senses and the care necessary to give to the organs of sense in order that their work may be done well.

"The kindergarten has undoubtedly taken an important step in the direction of properly training the senses; but we must not forget that only one step has been taken. The first letter in the alphabet of sense-training has been taught by the kindergartner, and, in many cases, well taught. The very damaging impression has become common with many teachers, however, that the child should have graduated in sense-training on leaving the kindergarten. Sense-training ought to be continuous and methodical until at least the age of twenty. In those ages when there were few books, the ages when Chaucer, Dante and Shakespeare lived, the training of the senses continued the entire life."—*Halleck.*

TEST QUESTIONS

1. How do well trained powers of observation assist in the development of the powers of reason and judgment? Illustrate.

2. What defects arise from training the sense of sight to

the neglect of the other senses? Give one or more illustrations from your own observation.

3. Give a full outline, including the selection of material, of the preparation the teacher should make for a lesson in visualization (sight-training) for the primary grade.

4. By what mental processes are you able to recognize a person by his voice, a bell by its sound, or the quality of a fabric by its effect upon the sense of touch? Give one illustration.

5. In what ways do games aid in sense-training? Illustrate.

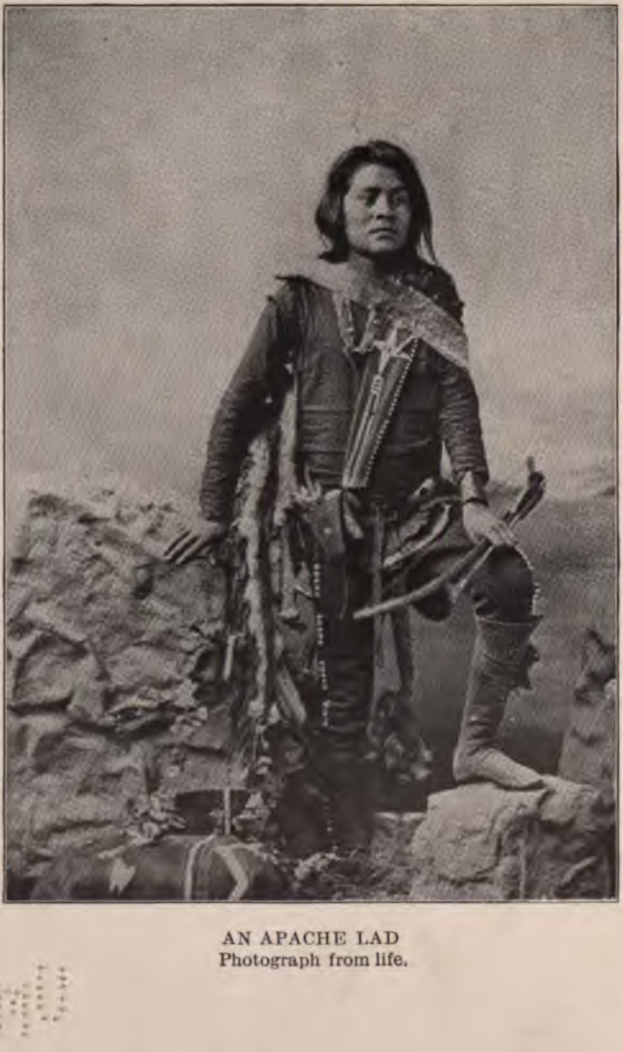
6. What is the relative value of the sense of touch compared with sight and hearing? What knowledge is gained through touch that is not conveyed by any of the other senses? Illustrate.

7. What exercises in sense-training can you plan for the children to practice by themselves out of school? Give two illustrations.

8. What cautions should be observed when referring to blind and deaf people for the purpose of illustrating the development of certain senses? Why?

9. Why should sense-training be continued beyond the primary grade? In an ungraded school, can the same lessons be used for all pupils? Why?

10. What studies are the most valuable for sense-training? To what sense does each study particularly contribute?



AN APACHE LAD
Photograph from life.

LESSON FOURTEEN

PHYSIOLOGY

1. The Teacher's Preparation.—No other teaching requires such thorough preparation as that in primary grades, and this maxim cannot be more forcibly applied to the teaching of any subject than to that of human physiology. The teacher should have a comprehensive knowledge of the facts and principles of anatomy, physiology and hygiene, and she should be able to make clear and forceful applications of these facts and principles without the use of technical terms; and above all, she should be able to adapt her lessons to the capacity of the pupils. The teacher should own one or more good physiologies of high school grade, and if she can afford it a larger work, such as Martin's *Human Body* (unabridged edition) or Retgers's *Advanced Physiology*. In addition to these, she should have two or three of the best primary physiologies in current use. The best of these books are of great assistance in the selection of material and the planning of lessons.

2. Purpose Outlined.—In the primary grades no attempt should be made to teach physiology, anatomy or hygiene as a science, not only because that would involve the use of many difficult terms and the study of intricate and difficult laws and relations quite beyond the understanding of such young children, but also because lessons of this sort usually react unfavorably upon the children.

Children under ten years of age should not be taught the complicated facts of anatomy; and seldom, if ever, should *they have their attention called to the structure or functions of the internal organs before reaching the fourth grade.*

It is important that primary teachers keep this fact constantly in mind in giving lessons on the human body. During the first three years of school life the mind is keenly susceptible to impressions. If led to dwell upon the structure and functions of the system, the vague ideas acquired are too often extended by a vivid imagination which at this period is not subject to the reason, and as a result the child becomes morbid and abnormally sensitive.

In the first three years of school life, however, the pupils may easily be taught many helpful and valuable facts pertaining directly to the human body and its daily needs. Such lessons necessarily will be based upon the elemental ideas of hygiene and upon the formation of right habits.

These primary lessons should be limited to the human body and made entirely practical, with no attempt to be exhaustive in the treatment of any of the sub-topics. The general aim should be to teach the pupils to recognize, locate and name the principal parts of the body, as head, trunk, limbs, and to teach the general laws of health.

3. Hygienic Results Expected.—By no other means, perhaps, can the child so readily be taught the importance of proper care being given to the body as through the direct teaching of hygienic facts and laws. By no other means can he so quickly be made to understand that, even in childhood, he must himself be directly responsible for a great portion of the care-taking necessary to health.

These elementary lessons should be carefully planned and systematically presented, each establishing a definite point, tending towards the ultimate aim of the series. The lessons must be brief and each new fact must be thoroughly taught, leaving no inaccuracies or misconceptions, to be laboriously unlearned later.

It may be more difficult to demonstrate the necessity for continuous care of the various parts of the body, and most difficult of all to create an interest deep enough to induce the pupils of the primary grades to form permanent habits of the right sort in regard to cleanliness, food and drink, fresh air, exercise and all else that pertains to hygienic living. To this end lessons on foods are very helpful.

The ends outlined above are not at all impossible, even in the rural school remote from the great commercial and educational centers. We believe that by means of lessons such as suggested many of the illnesses common among school children might either be wholly eradicated or lessened in frequency and in the severity of their after effects; also, that the knowledge thus gained by the children would extend, ultimately, to those homes wherein lurk all disease-producing conditions and gradually change such conditions into something more sanitary and wholesome.

There can be no doubt that by the establishment of thoroughly hygienic habits of living, the standard of morals and manners in any community is raised. This result might, and probably would, require a long time to secure, but once secured it would be lasting. For all reasons, then, a place for the lessons in elementary physiology should be made, even in the first school year.

The immediate effects of these lessons might not be so clearly seen in country districts as in the crowded tenement districts of the city, because the conditions for fresh air, pure water and wholesome food are generally better in the country than in the town. However, in the country there are less strict sanitary rules, and many bad habits of living are formed from ignorance of the commonest laws of nature. Moreover, the health of entire districts is often put in peril through ignorance of the precautions necessary in time of danger.

4. Correlation with Other Subjects.—(*a*) NATURE STUDY. The lessons upon the human body form an excellent and natural introduction to the study of other forms of animal life. It is nature study in its highest form, but may be presented first, rather than last, because of its special interest and personal value, and because the subject for study is always present.

These lessons, simple as they are, prepare the way to the understanding of the adaptation of the organs of other animals to their peculiar habits, propensities and localities. Observation and comparison are constantly appealed to and the children learn to see the striking resemblances and differences between the habits of life found in man and those of the lower animals, and, to some extent, they learn the reasons for such habits.

(*b*) READING, SPELLING AND LANGUAGE. In the study of the human body and its needs, the pupils are constantly enlarging their vocabulary, adding new words and phrases that enable them at once to express the new knowledge gained and also to modify and improve their expression of ideas previously obtained. The new things learned form the basis of many interesting blackboard reading lessons and furnish excellent material for spelling lessons.

(*c*) ARITHMETIC. These lessons are easily and naturally correlated with the elementary arithmetic work by having parts counted, relative and actual size, length, width and weight studied, measured and compared. Many interesting illustrations for the facts in number and many very simple problems may be based upon the work accomplished by these first lessons in physiology.

(*d*) ELEMENTARY GEOGRAPHY. Here again physiology may be correlated with one of the fully established subjects of the primary grades. This will come most easily and naturally when studying the homes of men and the homes of lower animals, with the natural and enforced reasons for the selections made; also in the third grade, by the study of the different articles of food and the sources from which they are obtained.

(*e*) SENSE-TRAINING. Physiology and sense-training are inseparably connected, since the training of the special senses would be of small value without a knowledge of the sense-organs. The facts relating to location, parts, adaptation to use, care needed to heighten their value, habits and things that are injurious, are all needed to put the training of the senses upon an intelligent basis and render the work of permanent, practical value.

5. The General Method.—All the lessons must be accurately taught, but presented in a friendly, informal manner, allowing freedom for examinations, comparisons and questions on the part of the children. Technical terms are not needed during the first three years and should not be introduced until text-books are taken up.

Whenever names of parts and other terms relating to the subject are used, such words should at once be written upon the blackboard and kept there for several days, if space will permit.

Before the lesson closes, give a brief drill upon the new words used. This drill should be upon pronunciation, recognition of words as wholes, and upon the spelling of each word. In case the blackboard space is limited, transfer the words used in these lessons to a chart page where they may be kept for building models, copying and other forms of review.

When any outside illustration is needed to make a particular point clear or to impress a truth, decide what this shall be and get it well in mind. To emphasize the usefulness of the eye we call it "the window of the body." The heart is "the great pump of the body that never stops day or night as long as life lasts"; "the best kind of feet are those like Minnehaha's, that 'run on willing errands' "; "the most beautiful faces are the ones that reflect beautiful souls in a pleasant, happy expression and good-natured smiles"; "the most beautiful hands are those that are always finding kind things to do."

These lessons upon general hygiene may be given in connection with lessons upon special parts of the body and their uses, or they may be given incidentally as fitting opportunities occur. They should be based upon analogies and should be wholly informal in character.

6. The Earliest Lessons.—There are so many new things that the child must become familiar with when he first enters school that the teacher should give a generous amount of time during the first two weeks to making him acquainted with his new environment and its requirements.

Necessarily, there must be much drill upon the uniform movements and the daily routine of the schoolroom. The child should be taught how to sit at his desk, how to rise easily and noiselessly, how to stand well poised, how to walk properly, how to run lightly across the floor and how to resume his seat quietly and gracefully.

There should also be systematic teaching and regular, daily drills in the art of breathing properly. All these exercises are of the highest sanitary and disciplinary value. They inculcate health and also teach the idea of perfect, instantaneous obedience by training the child's muscles to follow the example or word of the teacher and the child's will to obey her will in the commands pleasantly given.

The breathing exercises may be given in connection with the reading or spelling lessons, or as a part of the drill in phonics. Being a distinct help to such lessons, they cannot be said to encroach upon or waste the time properly belonging to the regular work as outlined by the program. They should always be brief, never taking more than one or two minutes of time.

The drills in schoolroom movements, for securing muscle-training and concerted, rhythmic action on the part of the class, should also be given without using time needed for regular recitations. To prevent encroachments, use for this work the five-minute periods designated on the program for rest, recreation, physical exercises or indoor recesses.

After the first two weeks of such training and drill, the children should be so familiar with the routine movements that daily work of this kind will not be necessary. When lapses of memory become frequent, correct the habit by a rapid review, being insistent upon accuracy and promptness.

After hygienic habits have become established by means of the foregoing methods, the pupils are ready to begin upon more formal lessons, although the manner of presenting them will remain informal. For the convenience of the teacher, the lessons are arranged in groups.

This does not imply that all the material included in one group is to be completed before the child may be given anything from another group. The grouping, as before said, is for the convenience of the teacher and practically covers under each topic everything that should be attempted during the first three years of school.

How much of one group of lessons to give before beginning upon another must be determined by the judgment of the teacher. She will see what is most needed and what her pupils are able to assimilate and put into practical use. Incidentally, in connection with every part of the day's work or play, there will be opportunities for emphasizing some hygienic truth or need. These opportunities are golden when made use of naturally, gently, tactfully and in the spirit of kindness.

7. Parts of the Body.—(*a*) MAIN DIVISIONS OF THE BODY. Head; trunk; limbs: upper (2), lower (2).

(*b*) LOCATION OF MAIN DIVISIONS. The *head* is the highest or topmost part of the body. The *trunk* is the middle portion of the body. The *neck* joins the head to the trunk. The *limbs* are four in number, two upper limbs, called arms, and two lower limbs, called legs. The arms, or upper limbs, are joined to the upper portion of the trunk, one on each side. The legs, or lower limbs, are joined to the lower portion of the trunk, one on each side.

8. Illustrative Lesson.—Stand a little boy in a low chair before the class. Pass your hands over his head, asking, "What am I touching, Nora?"

"Frank's head."

"And now, Harry?"

"Frank's arms."

"The arms are joined to what part of the body, Charlie?"

"The upper part."

"What are these, Nelson?"

"Frank's legs."

"The legs are joined to what part of the body, Minnie?"

"The lower part."

"And what is all this large middle part of the body called, William?"

It is doubtful if any child will give the name *trunk*. In that case ask, "How many can think just how a tree looks?" "What is the strong middle part of a tree called?"

"The trunk."

"And what grow out from the trunk of the tree?"

"Branches."

"What other name is there for the branches of a tree?"

"The limbs."

"Then the main parts of a tree are called what?"

"The trunk and limbs."

"Well, the strong, middle part of the body has the same name as the strong, middle part of the tree. Who can give the name now?"

"Trunk."

"Since we call this part (touching) the trunk of the body, if we still think about the tree, what may we call these (touching arms and legs) because they grow out from the trunk?"

"The limbs."

"And these limbs grow out from what part of the body (touching arms)?"

"The upper."

"So they may be called what limbs?"

"The upper limbs."

Use the same plan to get the statement that the legs are the lower limbs of the body. Review rapidly by touching the parts, having the children name them in concert. Write the first diagram upon the board. Review again by saying, "Fred may find his head." "John, lift your arms." "Harry, touch your legs." "Mary, show the trunk of your body," getting the correct statement, as, "This is my head," "This is my trunk," etc.

All the lesson must be given very rapidly and the interest kept alert by skillful distribution of questions and work. Ten minutes will be ample for such a lesson, and should bring every child actively into the recitation several times.

Use a similar method for each of the succeeding lessons of the course. Choose illustrations, objective and literary, with the utmost care. When the above lesson is again reviewed, explain that there is another reason for the name *trunk* of the body, that it holds most precious things inside of it.

9. Parts of the Head.—Top; hair; front or face: forehead, temples, eyes, cheeks, nose, mouth, chin; sides; ears; back; skull.

LOCATION OF PARTS OF THE HEAD. The *top* of the head is the highest part of the head and is called the *crown*. The *hair* is for both protection and beauty. It covers the crown and back parts of the head and partly covers the sides of the head.

The *front* of the head is the face and consists of the forehead, temples, eyes, cheeks, nose, mouth and chin. The *forehead* is the upper part of the face, lying just above the eyes. The *temples* are two in number, forming the right and left sides of the forehead.

The *eyes* are two in number and are set directly below the forehead, a little to the right and to the left sides. The *cheeks* are two in number and occupy most of the right and left sides of the face. They cover the bony structure and add beauty to the shape of the face.

There is but one *nose* to each face. It lies below the forehead, between the eyes and between the cheeks. There is one *mouth*. It lies between the nose and the chin. The *chin* is the lowest portion of the face.

There are two *sides* to the head, the right side and the left side. These lie between the front of the head (or face) and the back. The *ears* are two in number, one joined to the right side and one joined to the left side of the head. The *back* of the head is all that part of the head not filled by the top, front and sides.

The *skull* is the bony part of the head that gives shape to all the rest. It is hollow and made of parts carefully joined together. We cannot see the skull, but can feel it. The skull protects all parts of the head to some extent, but especially guards the brain. The *brain* is a very delicate organ of the body, located in the hollow of the skull. It is by means of the brain that we are able to do our thinking.

10. The Eyes.—(*a*) PARTS THAT PROTECT THE EYES. Sockets; brows; lids; lashes.

(*b*) THE LOCATION OF PROTECTIVE PARTS OF THE EYE. The *socket* is the hollow or bony framework in which the eye is placed. It protects the eye from injuries that might come from blows, collisions or other accidents. There are two sockets, one for each eye.

The *brows* are directly above the eyes. They are furnished with short, silky hair. The eyebrows add beauty to the face and protect the eyes by catching drops of perspiration, fine particles of dust and other minute substances that otherwise might fall into them and cause them to become inflamed and swollen.

The *eyelids* are four in number, two for each eye. They are called the upper and lower lids. These serve as curtains and help to regulate the amount of light admitted to the eye. They also protect the eye from sudden danger by dropping quickly over it in time of need.

The *eyelashes* are short, fine hairs attached to the edge of the eyelids. They turn upward on the upper lid and downward on the lower lid. They keep the edges of the eyelids from rubbing together and thus prevent soreness. They also guard the eye from dust, small insects and other things harmful to it.

Sometimes, notwithstanding all these protections, a tiny cinder, particle of dust or some other irritating object gets into the eye, creating great pain and serious inflammation. In such cases the eye should never be rubbed, since that increases the trouble. Draw the upper lid out and as far down over the lower as possible and hold it there steadily. Tears will speedily form and, in most cases, will succeed in washing out the offending particle, after which the inflammation will subside.

It is because the eye is the organ of sight, and because without sight we could do little for our own comfort and pleasure or for that of others, because the eye is the most delicate of all the organs of the body, except, perhaps, the brain, and is so easily injured beyond hope of recovery, that all these natural protections have been given to the marvelous organ.

(*c*) CARE OF THE EYE. The eye is so delicately constructed that it is extremely sensitive. The slightest irritation will cause intense pain, and it takes but a slight injury to the eye to destroy the sense of sight. Staring at the sun, staring into another's eyes at close range, reading or working in a dim or fading light, or with the sun shining strongly upon the work or reflected into the eye, "looking cross-eyed," holding a book too close to the eyes, and many other very common practices among children and thoughtless people, strain the eyes, weaken their power and, in time, permanently impair the vision.[1]

11. The Nose.—(*a*) THE PARTS OF THE NOSE. Bridge; sides; nostrils.

(*b*) LOCATION OF PARTS OF THE NOSE. The *bridge* is the center part of the nose, the firmest part. The shape of the nose is mainly determined by the shape of the bridge. The *sides* are the parts reaching from the bridge to the cheeks. The *nostrils* are two in number, one on each side of the bridge. These are openings to admit air in breathing and to give access to the nerves of smell. The walls of the nostrils are thin, flexible and delicate when of the best type for beauty and use.

For protection against particles of dust and other things, the nostrils are lined with short hairs which prevent these things from being inhaled with the breath.

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[1] Teachers should watch young pupils carefully and take steps at once to eradicate any of the faults enumerated above. They should also quietly and informally test the eyesight of the children and see that those whose eyes are weak or near-sighted are seated nearest the blackboard to prevent eye strain and errors in work. All writing, drawing, figures and work of any sort upon blackboard or charts should be large, clear and distinct, as stated in Lesson Six, p. 139. See also directions for testing the eye in Lesson Thirteen, p. 336.

The nose is the organ of smell and also the proper organ through which to take in air for the lungs. When the air is taken through the nostrils, as should be the case, it becomes slightly warmed while passing through the nose and fills the lungs without irritating them.

(*c*) CARE OF THE NOSE. In order that the sense of smell may remain keen and delicate and that breathing may be easy, the nostrils must be kept perfectly clean and free from obstructions of every sort. Children should be cautioned not to put foreign substances into the nostrils.

12. The Mouth.—(*a*) PARTS OF THE MOUTH. Lips; teeth; tongue; roof; palate.

(*b*) LOCATION OF PARTS OF THE MOUTH. The *lips* are two in number, called the upper and the lower lip. They form the doors to the mouth and when closed the mouth is closed.

In the mouth the food is prepared for the stomach by being properly chewed. Before it can be swallowed safely it must be chewed to a pulp and well moistened with saliva.

There are thirty-two *teeth* in a full set, four of these being cut after childhood and early youth are passed. These four are called "wisdom teeth" and are never found in a child's mouth.[1] The teeth have roots to hold them firmly in the jaw, and a hard, white coating, called enamel, to protect them from the air, heat, cold, etc. In the interior of each tooth are little nerves that are so sensitive that when the air touches them it causes toothache.

Very hot, very cold, very hard, very sour and very sweet things are liable to injure the enamel, hence must be used carefully. Never crack nuts or bite hard substances with the teeth. Particles of food left in the mouth are liable to cause the teeth to decay and render the breath foul; therefore, the teeth must be kept clean. Use a moderately stiff brush and clear water, brushing the teeth after each meal to remove all particles of food from between or around them.

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[1] At the time these early lessons are given, it may be that few children of the class will be found with the same number of teeth, this being the age in which most children are losing their first teeth and getting new ones.

The *tongue* is so attached that it can move freely and with great ease and flexibility. It is the chief organ of speech and the chief organ of the sense of taste. The sense of taste will be injured if food or drink excessively hot or excessively cold is used too freely. The sense of taste is in all parts of the mouth to some extent, but chiefly located in the tip of the tongue and in the palate. The *roof* is the upper part of the mouth and the *palate* the soft conical body projecting downward at the back of the mouth.

The one who wishes fully to enjoy the taste of what he eats or drinks, eats slowly, daintily, in small mouthfuls and not overmuch at a time. The glutton soon destroys all the delicacy of his sense of taste and therefore he loses the highest enjoyment that food can give. His sense of taste then ceases to warn him of the danger in unwholesome food.

13. The Ears.—(*a*) PARTS OF THE EAR. Outer rim; lobe; drum.

(*b*) LOCATION OF PARTS. The *rim* is the edge of the outer ear. It assists in hearing, protects the opening from dust and other dangers and adds to the good looks of the face.

The *lobe* is the lower end of the rim of the ear, more or less free from the head. It is sometimes so closely attached that it ceases to have any distinct form. Pulling the lobe of the ear gives intense pain and often causes harm beyond repair, therefore must never be done, even in sport.

The *drum* forms the partition between the outer and the inner parts of the ear. It transmits the sounds for the nerves of hearing. The drum is thin and delicate and easily broken. If, by accident or disease, the drum is broken, the sense of hearing is lost and the person is then hopelessly deaf.

(*c*) CARE OF THE EAR. There is a waxy substance that nature has given the ear for its protection. This is commonly called the ear-wax, is yellow in color and very bitter to the taste. It serves to keep the drum from getting so dry as to crack, and keeps out insects. It is a mistake to remove every particle of this wax, although it should not be allowed to accumulate and harden, as that sometimes causes deafness. The sense of hearing is also destroyed if the drum be punctured with a pin or some other sharp-pointed object.

The ear is supplied with a group of small, delicate bones that assist in hearing. These bones are in the middle ear and cannot be seen. They are so small and so easily displaced that even a slight blow should never be given to the ear, much less a heavy one. "Boxing" the ears is dangerous in the extreme.

Sharp, sudden and very loud noises and continued blowing in the ears are also very harmful and every care should be taken in guarding against them. Things done "just for fun" have frequently resulted in lifelong injury to the ear.

The ears must be kept clean or the sense of hearing will be less acute. The way to clean them is by washing carefully with a soft cloth, using water not extremely hot nor extremely cold.

After cleansing, the ear should be carefully dried and then lightly and quickly rubbed in front and behind (one finger back of it and one in front) for a little time to quicken the circulation and keep the nerves of hearing in an active condition.[1] The ear should never be carelessly filled with soapy water nor should water be left inside.

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[1] Exercises to develop the hearing (see lesson on *Sense-training*) will be of great value. It is believed that deafness sometimes comes on gradually for no real reason other than that the nerves of hearing cease to be active because they are not given sufficient exercise to keep them alert. In such cases, probably the individuals are excessively eye-minded, and depend but little upon the sense of hearing for guidance, either in their work or their recreations.

14. The Finger Nails.—The finger nails grow from beneath the skin not far from the ends of the back part of the fingers. The nails are without feeling, thin, horny and transparent enough to show the blood beneath them.

The mission of the nails is to give more firmness and strength to the finger ends and to protect them from injuries. The ends of the fingers are supplied with numerous fine nerves which would often be injured and the sense of touch seriously impaired were it not for protection of the nails.

Neglecting to care for the nails properly is a very common habit, especially among school children and people who have many cares and duties crowding upon them.

This neglect causes untidiness, "hang-skins," "hang-nails," white blotches upon the nails and other unsightly results. All these things may be prevented by early training and a little thoughtful care.

The nails grow rapidly and need to be carefully filed off or trimmed as often as once a week, following the shape of the finger tip, to keep them in good form. They should never be "cut to the quick," but allowed to grow out even with the ends of the fingers in order to render the service designed. They should always be kept scrupulously clean, but no sharp instrument should be inserted beneath. A nail brush of medium hardness should be used when the hands are washed, and afterwards a proper nail cleaner may be used, if necessary.

When drying the hands, always rub around the nails, carefully pushing back the skin at the roots to prevent its encroaching upon and covering the "half-moon" that should show there.

These instructions, carefully followed, will prevent "hang-skins," "hang-nails" and soreness and give a wholesome and shapely appearance to the finger ends. When the nails seem too brittle and inclined to break or tear, a little vaseline rubbed into them at night will materially reduce the trouble.

Nervous children often fall into the habit of biting the nails, causing much soreness and destroying the shapeliness of the finger ends. This habit also deadens and, in some cases, destroys the sense of touch in the finger tips.

It is not difficult to convince any one, young or old, that biting the nails is for all these reasons a very undesirable habit. Nevertheless, it is a habit difficult to cure. One of the best remedies is to stimulate the child's pride and encourage his effort by praising the improved appearance of the finger nails under the new régime. Never cease the encouragement till the bad habit has been crowded out and replaced by the proper care of the hands and nails.

In these lines, as in others relating to the care of the body, the teacher's example and sympathetic advice may result in lifelong good to her pupils, improving their personal appearance and removing many discomforts that grow out of ignorance and neglect.

When pupils have chapped hands, offer suggestions as to care, and some simple remedies, using a fitting time for the advice. Careless washing, strong soaps, imperfect drying and going out into the cold before the hands are entirely dry are the most common causes of chapped hands. Point out the causes first, then suggest the practice of washing the hands carefully, just before retiring each night. Dry the hands perfectly and thoroughly rub in a little mutton tallow, cold cream, or a lotion made of four parts of rose water to one of glycerine.

Caution. When giving lessons upon the hands, be sure that cleanliness is emphasized and encouraged by all proper means, example and precept united, but that no sarcasm is employed nor any person put to open shame.

15. The Skin.—The skin is a tight, soft-fitting cover to the body. It consists of two parts. The outer layer is thin, without blood vessels, and in itself has little or no feeling. The inner layer of skin is full of small blood vessels, is very delicate and very sensitive. The slightest scratch upon it causes pain.

When both skins are cut through, nature heals the hurt, but there is apt to be a scar. Illustrate this by showing a scar from a cut or burn, and by showing a garment that has been torn and mended.

The skin is a delicate, beautiful covering to the body; it gives off waste particles of matter through its thousands of pores, largely supplies the body with air needed for life, protects the flesh and blood under it against cold, and when entirely whole, clean and healthy protects against infection, even when handling poisonous substances.

A good magnifying glass can be used to enable the class to understand the nature of the pores and to get some idea of their great number. Emphasize the need of keeping the skin perfectly clean in order that it may perform the duties intended. The pores must be kept open (clean) by bathing and brisk rubbing, or the air cannot enter, nor the waste, poisonous particles be carried off by the perspiration.

Explain, further, that without perfect cleanliness the body will give off a very disagreeable, offensive odor, that it will become unhealthy and liable to pimples, blotches, etc.

The skin needs plenty of fresh air and frequent exercise out of doors to keep it fresh and healthy. When a person stays too much indoors in over-heated rooms, the skin becomes dry and sallow.

The appearance of the skin covering the face is called one's complexion. To have a clear, fresh, beautiful complexion there must be entire cleanliness, plenty of fresh air, proper clothing (warm enough, but light in weight and loosely fitted), plenty of regular sleep and exercise, with simple, wholesome food and drink.

The following groups of lessons are suitable for third grade work, and should be extended by the addition of lessons on food and proper habits of eating and drinking.

16. Parts of the Neck and Trunk.—(*a*) PARTS OF THE NECK. Throat; windpipe; back.

(*b*) PARTS OF THE TRUNK. Shoulders; breast; stomach; back; abdomen; hips.

Pupils locate, name and learn the uses of the above parts. This work will be general in character, since the details of this part of physiology must be left until higher grades are reached and pupils are better able to comprehend the difficult processes of digestion, blood circulation, blood purification and the like.

Dwell upon the work of the visible parts and do not try to make these lessons exhaustive.

17. The Limbs.—(*a*) PARTS OF UPPER LIMBS OR ARMS. Main arm; forearm; wrist; hand.

(*b*) PARTS OF THE HAND. Fingers, five, including thumb; finger nails; palm; back.

(*c*) NAMES OF THE FINGERS. Thumb; index finger; middle finger; ring finger; little finger.

(*d*) PARTS OF THE FOOT. Instep; toes; sole; ball; heel.

After teaching the location and name of each of the above parts, the most obvious uses may be taught; as, "The arms, wrists, hands and fingers enable us to reach, take up, hold and carry things, both large and small, if not too heavy for us to lift." "The legs, feet and toes enable us to walk, run, etc."

After these general uses are taught, it will be better to leave this group of lessons until after one or two lessons upon the joints.

18. The Joints.—(*a*) JOINTS OF UPPER LIMBS OR ARMS. Shoulders; elbows; wrists; knuckles; finger-joints.

(*b*) JOINTS OF LOWER LIMBS OR LEGS. Hips; knees; ankles; toe-joints.

Teach location, name, number and use of each of the joints and care needed.

19. Plan.—The joints may best be explained to little children as hinges. Sometimes they connect smaller parts to larger parts, sometimes two parts of about the same size. Be sure to bring out the fact that there could be no bending without the joints, and that their specific work is to join parts of the body in such a way as to enable the body to bend in different directions and to take different positions. Emphasize the value of this power to us by having the class try to do various things without bending the knees and elbows.

When the children have learned all that is at this time necessary concerning the joints and can readily locate and name each without assistance, the parts of the limbs may be reviewed, general uses recalled, and several lessons given to teach the more intricate uses of the hands and feet, and the special adaptation of the parts of each to their specific duties.

There should also be one lesson upon the marked difference between the hand and foot as to location, size, shape, use and adaptation to use. The facts to be included in this lesson are as follows: The hand is a part of the upper half of the body, placed at the end of the arm and in a line with it. It seems to be an extension of the arm, so to speak. The hand is thin and its palm may be bent to form a cup-like hollow, so as to hold things better. The palm ends in a row of four long, flexible fingers. The thumb is so arranged that it can be brought opposite any one of the four fingers, making it an easy matter to touch, pick up, grasp and hold any object not too large or too heavy.

The sense of touch is found in all parts of the body, but is very highly developed in the tips of the fingers, making it possible for us to pick up, adjust and work with the most delicate materials, and to use tools of fine quality and small size.

Compared with the hand, the foot is thick and stiff. The instep is arched, to give strength and flexibility in walking. The ball of the foot is broad and flat, to give firmer support to the body in standing or walking. The five toes are arranged in one row and are shorter than the fingers and give far less aid to the sense of touch. The joints in the toes give an ease and elasticity to walking, running, jumping and other necessary movements.

Caution. Keep in mind that the purpose of these lessons will be lost if the teaching does not fill the child with a deep sense of gratitude for the wonderful house he has been given for his mind and soul to dwell in, and impress him with his responsibility for its proper care.

20. The Eye.—(*a*) VISIBLE PARTS OF THE EYE. Eyeball; iris; pupil.

(*b*) LOCATION OF PARTS OF THE EYE. The *eyeball* is the ball-shaped portion of the eye. It is white, smooth and glistening and rests easily in the socket, held in place by muscles created for that especial duty. Children call the eyeball "the white of the eye."

The *iris* is the colored part of the eye. It is not always of the same color. When it is blue, we say the person has blue eyes. When the iris is gray, we say that person has gray eyes. And so for brown, hazel and black, the eyes in every case being named according to the color of the iris.

The *pupil* is in the center of the front part of the eyeball. It is an opening in the iris that admits light to the eye. It always looks black, because of what lies back of it inside the eye. The pupil is frequently called "the window of the eye," because it lets the light in.

The following groups are suitable for pupils of the fourth and more advanced grades. The lessons outlined show the plan to be pursued. Similar lessons on the muscles, digestive organs and the brain and nerves should be added.

21. The Bones.—Ask the class to find the bones of the arm, the forearm, hand and fingers. Call attention to the bones of the lower extremities and notice why they are larger than those of the arms. Proceed to the bones of the head and trunk. There will probably be enough physiologies in the school so that the pupils can have the use of a diagram of the skeleton. The structure of the bones can be seen by examining a beef bone. It is well to let the pupils examine it both before and after cooking, so that they can see what has been extracted by heat.

The names of the bones should be learned at this time.

(*a*) BONES OF THE HEAD. Face, fourteen, besides teeth; skull, eight; ear, three.

(*b*) BONES OF THE TRUNK. Spine and twenty-four ribs; breast-bone; collar-bone; pelvis, four.

(*c*) BONES OF ARM AND HAND. Upper arm, one; forearm, two; wrist, eight; hand, five; fingers, twenty-eight in all.

(*d*) BONES OF LEG AND FOOT. Hip, one; thigh, one; below knee, two; knee-cap, one; ankle, seven; foot, five; toes, fourteen; thirty-one in all.

The above are all the bones of the body that are practicable to teach at this time, and all that can be accurately located without a skeleton.

Lessons on muscles may profitably follow those on bones.

22. The Blood.—In the first lessons on the blood it can be compared to the juices of plants and the sap in trees. Teach its use in nourishing the body and carrying off waste tissue. Show that pure blood is essential to health and that this condition depends upon cleanliness, fresh air, exercise, proper food and drink, a necessary amount of sleep and proper clothing. The older pupils should study the veins, arteries, heart and circulation. Name and locate arteries, veins and capillaries, teaching the general difference in their functions, but avoid the use of technical terms.

It will be well to teach how to recognize when a vein or an artery is severed and what to do in such cases, pending the arrival of the nearest physician.

Lessons on the blood should be followed by those on respiration.

23. Waste and Repair.—A series of very interesting and very valuable lessons may be given upon what agencies tend to create fatigue, wear and waste in the body and what agencies restore and rebuild it.

The body is like a great, busy workshop, where many kinds of labor are going on all the time, day and night, as long as life lasts. The machinery of this wonderful workshop is of many kinds and each part performs a curious and complex duty. All are necessary to the complete working, and perfect health is maintained only when each part performs its functions.

(*a*) AGENCIES THAT WEAR AND WASTE. Breathing; growing; working; running; walking; overeating; very high heels; unwholesome food; tobacco; alcoholic drinks; lack of sleep; lack of exercise; lack of ventilation; tight clothing; disease; evil thoughts, envy, hate, jealousy, spite, greed; worry; uncleanliness.

(*b*) AGENCIES THAT REPAIR AND REBUILD. Fresh air; sleep; wholesome food; pure water, pure milk; regularity of living; outdoor exercise; serenity; contentment; congenial work; kind thoughts; cleanliness; noble ambitions; high ideals.

24. Correlated Literature.—Through the teaching of appropriate songs, maxims, poems and proverbs in connection with the lessons upon the human body, the vital truths of the latter will be more deeply impressed and much longer remembered than otherwise.

To illustrate. With the lessons upon the mouth, teach, "Keep thy tongue from evil and thy lips from speaking guile." Read the fairy story of the little girl who opened her lips only to let venomous things come out. Teach, "Speech is silver, but silence is golden," and

"If you your lips
Would keep from slips,
Five things observe with care:
Of whom you speak,
To whom you speak,
And *how* and *when* and *where*."

With the lessons upon the hands, teach the poem, *Beautiful Hands;* the action song, *Raise Your Hands if They are Clean;* the game, *Washing Hands;* the proverb, "Cleanliness is next to godliness"; the command, "Whatsoever thy hand findeth to do, do it with thy might," and Psalms xxiv, 3 and 4.

The above are sufficient to illustrate what is meant by the term "correlated literature," but words can scarcely express the value of such teaching given in the impressionable years of early childhood. A teacher possessing the mother heart will realize the need of such teaching and be diligent to find ways of accomplishing it.

25. Temperance Physiology.—That there is need of giving lessons in temperance to all children requires no argument. It is self-evident. Unhappily, abundant proof of the evil results of intemperance is on every side, not even the country districts being exempt.

The need of temperance lessons is so apparent that all states but one have enacted positive laws requiring such teaching in all the schools of the state. It is unfortunate that those laws usually specify "alcohol and tobacco," but omit opium, cocaine, absinthe, profanity, obscenity, impurity, gluttony, luxurious and idle habits and many other things that militate so strongly against temperate living in its highest and best sense.

It is sad, but true, that temperance teaching measured by results has been almost a total failure in most schools. Even in schools where the evil effects of alcohol and tobacco have been demonstrated by every scientific experiment that could be used in the schoolroom, the result has not been satisfactory. The teachers have done their duty as they understood it and carried out the state law to the best of their ability. These failures are due largely to a failure in appreciating when, where and how temperance teaching should begin and to a lack of knowledge of the real foundations of this work.

No teaching of temperance physiology that is based only on "scientific temperance" has ever produced the desired results. Briefly stated, this teaching, to be truly successful, must rest upon a base composed of high ideals, self-control, self-respect and a genuine love of what is right, clean and pure in life, both private and public. Cement these elements solidly together in the character of a child and we shall have a foundation that will be able to resist the assaults of all temptations.

The work should begin in the home when the child is an infant, with mother, father, brothers and sisters to teach by precept, and more by example, habits of absolute obedience, regularity in eating, drinking, sleeping—thus laying the foundations of self-control and the recognition of proper authority. In the home, too, the child should learn lessons of abstinence in speech, in eating and in drinking, and should never form the habits of vulgarity, gormandizing and gluttony, or intemperance in any respect.

From the day the child enters the primary school until he leaves school forever, the teachers should see to it that the will power is strengthened, not broken; that self-respect is fostered by every means possible; that right conduct is kept ever uppermost; that worthy motives and ambitions are implanted through examples chosen from life, from biography and from history, by means of fables, anecdotes, maxims, proverbs and poems.

This work forms the strong, sure substratum upon which "scientific temperance teaching" will rest securely and permanently. It is most successful when the teacher works persistently, patiently and skillfully, letting the pupils learn her purpose inferentially. Loud and frequent declarations of intention nearly always destroy success in advance.

There is little or no place in the primary grades for direct "scientific temperance teaching," since that requires explanations, reasons and demonstrations beyond the full comprehension of the classes. When such work is attempted too soon, children are liable to misapprehend and carry home such garbled versions of what the teacher does and says that antagonism is aroused and defeat follows.

It is better to leave these formal lessons in temperance until pupils are older. In the primary grades keep character building and will training always in mind and make use of every opportunity, in school and out, to strengthen these as a defense against temptations of all sorts.

When intoxicated people are seen, or when men appear with cigarets, cigars or pipes; when one is seen crazed by cocaine or stupefied with opium, the children have recognized the illustration and a few words then and there, if fitly spoken, will have deep and lasting effect for good.

Impressions sink deeply into childish hearts. A boy's will may, indeed, be the wind's will, but "the thoughts of youth are long, long thoughts." Therefore, use no words of sarcasm, ridicule or contempt, neither permit them to be used, when intemperance of any kind is seen. Lower the voice, speak words of pity and words of deep, sincere regret, and show how much more such persons would be respected if these things were not. Speak gently and do not say too much.

TEST QUESTIONS

1. In which schools are early lessons in physiology the more needed, those in the city or those in the country? Give reasons for your opinion.

2. Why does the teacher need a thorough preparation for teaching physiology in the primary grades? What can the teacher do by herself to obtain this preparation?

3. Would you give the same lessons to the primary grades in a rural school and to a city primary school? If not, wherein should they differ, and why?

4. What relation exists between children's play and lessons on hygiene? How can you use these relations in your teaching?

5. In what respects should lessons given pupils in the third grade differ from those given in first and second grades? Outline a lesson on the joints of the arm and hand, such as you would give a fourth grade class.

6. In what grade should a text book in physiology be introduced? Outline your plan for introducing it.

7. What dangers arise from the use of common things to illustrate anatomical and physiological facts, such as referring to the joints as hinges, the heart as a pump, etc.? How can such dangers be avoided without omitting the illustrations?

8. How would you show your pupils that such acts as walking, running and breathing lead to waste of tissue? What illustrations can you give of the repair that the system is constantly undergoing?

9. What are the requirements of the law in your state relating to the teaching of physiology? What difficulties do you have in meeting these requirements?

10. What is the relative value of will training and instruction concerning the effects of stimulants and narcotics upon the human system? Give reasons for your statement.

DAISIES
Photograph from life.

LESSON FIFTEEN

NATURE STUDY

1. Why Nature Study is Important.—(1) Nature study furnishes material, abundant, interesting, valuable and varied, for lessons in language, reading, number, form, color, size, drawing, clay modeling, sewing, cutting and pasting.

(2) It trains all the special senses to greater usefulness and develops the powers of observation, comparison and reason.

(3) It arouses sympathy, kindles the imagination, develops kindness in word and deed, awakens reverence and strengthens the will to do right.

(4) It affords endless food for thought and arouses interest in and respect for patient labor and for industry in all its forms.

(5) It affords culture that is broad, varied, generous and useful to the end of life.

(6) It furnishes much practical information, preparing the way for the future study of botany, zoölogy, geography and kindred subjects.

(7) It leads to a better understanding and appreciation of art in all its forms.

(8) It develops the power to see and enjoy beauty in all that God has created.

(9) "That the child may be reverent and upward-looking, and that he may come to know himself as subject to eternal laws, we would have him study nature."—Sarah L. Arnold in *Waymarks for Teachers.*

(10) "We have become convinced that some intimate, sympathetic acquaintance with the natural objects of the earth and sky adds greatly to the happiness of life, and that this acquaintance should be begun in childhood and be developed all through youth and maturity. A brook, a hedgerow or a garden is an inexhaustible teacher of wonder, reverence and love. The scientists insist to-day on nature study for children, but we teachers ought long ago to have learned from the poets the value of this element in education. The idea of culture has always included a quick and wide sympathy with men; it should hereafter include sympathy with nature, and particularly with its living forms, a sympathy based on some accurate observation of nature."—President Eliot of Harvard University.

2. Apparatus Needed. — (*a*) REFERENCE BOOKS. The teacher should have a few standard works of reference on botany, zoölogy and minerals; also one or more good books treating of nature study. None of these needs to be expensive. For prices and publishers see the bibliography on page 415.

(*b*) STENCILS. Blackboard stencils are inexpensive and will facilitate both the rapidity and accuracy of the blackboard work. Stencils for nearly all well-known varieties of trees, shrubs, flowers, fruits, insects, birds and animals can be procured at five cents each or at the rate of twenty-five for one dollar.

(*c*) ILLUSTRATED FLOWER AND SEED CATALOGUES. These may usually be obtained by writing to well-known dealers in this line. These catalogues supply much useful information difficult to get elsewhere, and furnish good models for lessons in coloring when not enough natural specimens are at hand to supply the class.

(*d*) OPERA GLASSES. Opera glasses with large eye pieces are desirable if one wishes to study the habits of wild birds. The timidity of the birds makes it impossible to study them at close range, and the glasses enable the teacher to obtain the information by which she may identify birds that the children observe in their rambles or drives about the country.

(*e*) A MICROSCOPE. A pocket microscope is convenient in the examination of flowers and insects of the smaller species, and when minute details are to be studied or definite classifications made it becomes a necessity.

(*f*) CHARTS. There are good colored charts of birds, animals, fishes, insects and flowers that will materially help the work and are not expensive. These are desirable, but not indispensable.

(*g*) NOTE BOOKS. Each child should have a note book in which to record observations. These books may be homemade, and should be about six inches square. If used in the primary grades, they should contain but brief records. To illustrate: Make a general note book having at least twelve leaves, and give a proper share to each month. On the cover print or write in large letters, *Nature Study*, with the owner's name and the year. Above each section place the name of the month, *March*, for instance. Have each pupil make records like the following:

First robin, March 8.
First crow, March 15.
First pussy willow, March 20.
First anemone, March 29.

The records are to be made with neatness, and should be kept for comparison in following seasons. This is useful and lends dignity and encouragement to the work.[1]

Cautions. 1. Teachers who are not able to secure the aids to study mentioned above should not be discouraged; much can be accomplished even without them.

2. Use familiar, natural specimens belonging to the imme-

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[1] In some schools the use of note books by the pupils is not attempted until the third grade, when children are better able to write independently. The teacher's judgment must determine the time.

diate neighborhood, borrow pet birds and animals belonging to the children and, if possible, add to the collection by borrowing stuffed specimens from the nearest high school museum.

THE STUDY OF PLANTS

3. The Study of Plants.—Before taking up the study of any one plant in particular, it is well to make a general study of several of different species, that the pupils may learn the characteristics common to all plants, viz., the parts of a plant and the use of each part to the plant as a whole.

4. Outline of Work.—(*a*) PARTS OF A PLANT. The parts of a plant are the root, stem, leaves, flower, fruit and seed.

(*b*) KINDS OF ROOTS. Roots are fibrous or thread-like, branching, fleshy, conical, bulbous, spindle-shaped.

(*c*) USES OF ROOTS. (1) They hold the plant firmly in the ground. (2) They reach down into the ground and draw nourishment from the soil to feed the plant. (3) They are often used as food for both man and beast, as turnips, carrots, beets, etc.

(*d*) STEM OR STALK. The stem or stalk bears the branches, buds, leaves, flowers and fruit.

(*e*) KINDS OF STEMS. (1) *As to Manner of Growth.* Stems are erect, drooping, creeping, trailing, ascending, climbing, twining, underground.

(2) *As to Structure.* Stems are herbaceous or woody. Herbaceous stems are juicy and weak; woody stems are strong and contain bark, wood and pith.

(3) *As to Color.* Stems are green, brown, red, purple, striped, spotted.

(4) *As to Form.* Stems are round, half round, compressed, fluted, acute-angled, triangular, square, four-sided, five-sided, etc.

(5) *As to Surface.* Stems are smooth, rough, dull, shiny, hairy, etc.

(*f*) USES OF STEMS. The uses of stems are: (1) To bear the parts of the plant, (2) to supply the leaves, buds, flowers and fruit with sap; (3) in some cases to be used as food or medicine.

(*g*) TERMS NEEDED FOR OLDER PUPILS. A node is a joint of a stem, where a leaf comes out. An internode is the part between two nodes. The axil of a stem is the angle between the upper portion of the leaf stem and its parent branch. According to their arrangement on the stem, buds are alternate, as in the elm; opposite, as in the maple, and whorled, as in the pine. Scales are leaf-like parts of the stem that cover and protect the growing buds.

5. Leaves.—(*a*) PARTS OF A LEAF. The parts of a leaf are the blade, or the flat part; the petiole, or leaf stem; the stipules, or tiny leaves at base of the petiole; the base, or lower end near the petiole; the apex, or tip opposite the base.

(*b*) KINDS OF LEAVES. Leaves are simple, having one blade, as burdock; compound, having three or more small blades, as clover, locust, rose leaves.

(*c*) VENATION OR VEINING. Leaves are net-veined, like those of the maple and elm; parallel-veined, like those of the lily and grasses. Net-veined leaves are feather-veined when they have one large vein, called the midrib, extending through the middle, and smaller veins branching off from that, as in the elm. They are palmate-veined when two or more main veins arise from the point where the petiole is joined, as in the maple.

(*d*) EDGES OR MARGINS. The margins are entire, bounded by an unbroken line; wavy, bounded by a wavy line; serrate, like the teeth of a saw; dentate, having larger teeth, etc.

(*e*) SHAPES OF LEAVES. In form, leaves are palmate; wedge-shaped; lance-shaped; arrow-shaped; heart-shaped; oval.

Leaves having their margins very deeply cut, like those of the soft maple and oak, are said to be lobed or cleft.

(*f*) LEAF BUDS. Leaves come from buds, the same as flowers do. These are growing slowly all winter, snugly packed away in protective covers. In the spring they swell and grow rapidly larger till the leaf uncurls. Leaf buds are usually longer and more pointed than flower buds.

(*g*) USES OF LEAVES. (1) Leaves are the lungs of the plant, supplying it with air. (2) They supply the air with moisture and in this way increase the amount of rainfall in the vicinity of large forests. (3) They give shade, shelter and beauty for man and beast. (4) They supply food, medicine, and materials for manufactured goods of special kinds.

6. Flowers.—(*a*) PARTS OF THE FLOWER. The parts of a flower are the calyx, or outer circle of leaves, usually green but sometimes colored; the perianth, the name given to include the two circles when they have the same color; the sepals, or parts of the calyx; the petals, or parts of the corolla; the stamens, or thread-like parts within the corolla; the filament, or stem of the stamen; the anther, or head of the stamen; the pollen, or dust in the anther; the pistil, or central part of the flower; the ovary, or base of the pistil holding the seeds, the seed box; the style, or stem of the pistil; the stigma, or head of the pistil; the carpel, or one cell of the ovary; the fruit, or the ovary and adhesions when ripe; the peduncle, or flower stem; the receptacle, or top of the peduncle, from which the blossom grows.

(*b*) ODORS OF FLOWERS. By experiments with fresh plant specimens, lead the pupils to see that each plant has its peculiar odor and to distinguish these odors as agreeable and disagreeable, the latter being variously designated as noxious, nauseating, etc. It is interesting to know that some of these bad odors seem to be for the protection of the plant, to enable it to ripen its seeds without molestations.

(*c*) SHAPES OF FLOWERS. Flowers are cup-shaped, bell-shaped, star-shaped, trumpet-shaped, butterfly-shaped, etc.

(*d*) USES OF FLOWERS. (1) Flowers are useful to supply insects and birds with food; (2) sometimes to supply food to man; (3) to minister to the sense of beauty; (4) to yield perfume.

7. **Fruit and Seed.**—The ripened product, the sum of the plant's life and work, is its fruit.

(*a*) KINDS OF FRUITS. Fruits are generally classified as fleshy and dry. They may also be classed as edible and non-edible; edible for birds, etc., and not for man. They may also be classified according to size, shape, taste; as, an orange is large, round or oval, acid.

(*b*) SEEDS. The essential part of the fruit is the seed, by means of which the plant may reproduce its own kind.

(*c*) PARTS OF THE SEED. (1) *The Embryo or Germ.* This is a miniature plant inside the seed, all ready to grow when the seed is sown and cared for. It consists of a pair of tiny leaves (cotyledons) on the summit of a little stem called the caulicle.

(2) *Albumen.* This is a nutritive material packed by the mother-plant around the embryo to supply food for its earliest growth. Sometimes the albumen is not around the embryo but forms a part of it.

(*d*) DISTRIBUTION OF SEEDS. Seeds are scattered by wind, by birds, squirrels, wool or hair of domestic and wild animals, clothing of people, by water, etc.

(*e*) MEANS OF TRANSPORTATION. Among the organs by which seeds are distributed are wings, as in the maple, linden, dock; hooks, as in burdocks, stick-tights, beggar-ticks; springs, as in touch-me-not, teasel; sails, as in cat-tails, dandelion, aster, goldenrod, milkweed, thistle, witch-hazel.

Seed distribution is one of the most interesting phases of plant study to children of the first four grades. This is due to the novelty of the subject, variety of methods and the wonderful adaptation of parts to purpose.

(*f*) MEANS OF PROTECTION. Seeds are protected by shells, burrs, fleshy pulp and color.

(*g*) USES OF FRUITS AND SEEDS. The uses of fruits and seeds are to perpetuate the life of the plant; to furnish food for birds, animals and man; to furnish material for some valuable oils. Were the plants to cease producing fruit and seed, animal life could not long be maintained in its present forms.

8. General Uses of Plants.—(1) Plants purify the air for all animal life. (2) They furnish the greater part of the food for insects, birds, animals and mankind (3) They supply, directly or indirectly, all the food of the world. (4) They furnish most of the clothing for man. (5) They supply materials for homes, utensils, tools, furniture and ships, and enter largely into nearly everything used by man, either for convenience or luxury. (6) By means of vines, flowers and trees, they add immeasurably to the beauty of the world. (7) By giving shelter in times of storm, protection from heat and cold, and supplying materials for medicines, antidotes, etc., they add to the comfort and safety of nearly all forms of animal life.

9. Instruction.—It is not expected that the teacher will attempt to give to primary pupils more than a small part of what is here outlined for general work. The outlines have been made full for the direct aid of the teacher, who may not be able to secure all the books needed to guide her in her work with the younger pupils and to enable her to carry the work into higher grades.

The main facts common to all plants may be taught either as a group of lessons to precede the study of specific plants, or the truths may be gradually reached by means of the specific study of many plants, both wild and cultivated. The former method would seem the more logical, using wild and cultivated plants as illustrations; but, with young pupils, that way is best which holds their interest and best spurs them on to individual effort in gathering specimens and studying their parts.

The object in the first year or two is not so much to present a certain amount of information about plants as to awaken a real interest in plant-life that will lead the children to observe the plants of their own vicinity, to learn their names, and to give the simplest description of their parts and habits of growth.

When these simple studies in plant-life are led by an earnest, high-minded teacher, the children always gain incidental lessons in patience, truth, perseverance, obedience to law and the relation of plant-life to man's life.

Caution. In nature study, as in physiology, teachers need to refrain from purely technical terms until the pupils are old enough to use them understandingly. When occasion makes the use of such terms necessary, illustrate their meaning and make the class familiar with them the same as when teaching any other new words.

10. The First Year.—When any plant is studied scientifically, the seed is examined, planted, its germination watched, and each part definitely studied according to the order of its unfoldment—roots, leaves, stem, etc. The blossom and the maturing of the seed are reached as the last and culminating work.

With the primary children we sacrifice the logical order of study and begin where interest will be greatest, namely in the blossom. Study several whole plants in blossom. Let the imagination aid the memory. Refer to Hale's *Little Flower People* for help in teaching the life of a plant and the service each part renders. The following extract is particularly good:

> The Flower Household includes:
>
> 1. The Flower Mistress.
> 2. The Leaf Servants.
> 3. The Stem Servants.
> 4. The Root Servants.

The Leaf Servants.	To eat and drink for their mistress. To aid in breathing and digestion. Sometimes to protect her.
The Stem Servants (or Nurse Stem)	To uphold the flower mistress and the leaves. To aid in distributing the crude and the prepared sap.
The Root Servants.	To bring water and food materials for the household. To hold the flower home in place. Sometimes to help the flower in climbing.

> "Little Foot-pages"—stipules.
>
> The flower, so precious because she guards a hidden treasure—the part that does not die.

11. Work for First Grade.—The chief parts of the plants, the "pollen-boxes," the "seed-cradles," the members of the "Flower Household" and, in general, how each member of the family does its work, the children should be taught. They should also have simple lessons on leaves, buds, stems and roots.

The teacher should make many original blackboard reading lessons as the outgrowth of plant observations, getting most of the statements from the children.

Cautions. 1. The teacher should always remember to include with plant study, timely lessons on number, color, form, size, language and spelling, as well as the reading lessons already referred to.

2. In each grade have the children draw the part as they study it. This is one of the most important features of the allied work. Crude work resulting from object drawing is

of far greater benefit to the child than more perfect results from copying. Criticise gently, and always with the object present from which the drawing was made.

12. Work for Second Grade.—Review the work given in the first grade by studying other flowers. Add the terms stamen, pistil, sepal and petal. These are all the time occurring and will not be difficult. They could be given in the latter part of the first year if the class is far enough advanced. Compare parts of different flowers as to color, size, form, number and arrangement. Compare homes of flowers as to soil, altitude, climate, light and care. Keep a list of the flowers pupils bring in with a record of the date of blossoming, and teach the class to know each flower by its familiar name. Work for more accurate results in the drawing of parts. Extend the work on leaves, stems, roots, buds and fruits.

Caution. Teachers should always keep a list of the flowers studied by the different classes, that they may have fresh material each season.

13. Work for Third Grade.—Thoroughly review all the preceding work by means of new flowers. Study the germination of familiar seeds by means of window gardens in the schoolroom and at home. Give observation lessons on the distribution of common seeds. Enter upon the uses of plants to man, to domestic and wild animals, insects, etc. The object is to establish a permanent interest in plant-life, to enable pupils to recognize and name the plants common to the neighborhood, and to become familiar with their chief characteristics and varying degrees of usefulness. Continue the study of buds, leaves, stems and roots.

"Lead the children so to see that they shall feel the perfection of each tiniest part [of the plant], the purpose and plan which we find in every bit of nature—sympathy with its growth, the unity of life—each whole a part of and related to a larger whole. Each, ministered unto by rain, sun and soil, fulfills its own destiny—the ripening of its fruit—the undying part. . . . Aim to rouse so much interest in growing plants that each child will be watching through the summer the constant growth toward maturity of the seed. Urge each pupil of the third grade and above to keep records, during the summer, of changes noticed in particular plants he has selected for observation; also records of dates of finding new flowers as they open in garden or woods—with notes telling where found."—*Mrs. Alice W. Cooley.*

14. Work for the Higher Grades.—For the sake of the teachers of ungraded town schools and rural schools, it seems desirable to make the nature study outlines cover more than the first three grades; hence we indicate work that may be done by fourth and fifth grade pupils of town schools or by the older pupils in country districts.

(*a*) REVIEWS. As before, the facts gathered from previous lessons must be kept in mind by means of reviews that come through the study of new specimens. These specimens ought, as a rule, to be obtained by the pupils themselves, since only by making such collections will they secure accurate knowledge of the location and habits of growth peculiar to each plant discovered.

(*b*) NEW WORK. Gradually add the terms anther, filament, stigma, style, ovary, carpel, peduncle and receptacle, as the flower is studied in its more minute functions, making these terms necessary for expression.

Study buds, leaves, stems and roots as to their form, size, color, arrangement and use, and make classifications after careful comparison of many specimens. The classification in tabulated forms may be placed upon the blackboard or upon large sheets of manila paper, and kept in sight for constant reference.

Plants should also be classified as useful or harmful.

The term *weed* will not serve the purpose here, some so-called weeds being of great value for medicinal and other purposes. Great care should be given to the teaching of successful methods of exterminating plants that are poisonous, as poison ivy, poison oak and nettles; or those seriously objectionable in their nature, as the thistle, tumble-weed, stick-tights, rag-weed and numerous others.

Grains and other useful plants should be studied as to the soil, climate, moisture and manner of cultivation needed to bring them to perfection and keep them healthy.

Make a study of the enemies of useful plants and of the best methods of protection against them. Also study the most successful methods of prevention or extermination of these enemies. Here, more than elsewhere, will the patrons of the school recognize the utility of this branch of work; and to this they will lend the teacher willing and valuable assistance in the form of information gathered from long observation. They will, also, be able to suggest methods of protection and prevention that repeated experiments have proved of value. In return, their own boys and girls will lend more intelligent and willing service in applying these methods, as the result of the lessons.

15. Literature.—With each flower studied, some beautiful and appropriate quotation should be taught, the length and difficulty being regulated to suit the age and ability of the class. To illustrate: Suppose the pansy is the subject of study; in the first grade give this stanza by Dunroy:

"Purple for shadows, gold for sunshine,
White for the clouds on high,
Brown for the earth that gave them birth,
And blue for the azure sky."

To the second grade give the following:

"Of all the bonny buds that blow
In bright or cloudy weather,

Of all the flowers that come and go
The whole twelve months together,
The little bright-faced pansy brings
The sweetest thoughts of pleasant things."

The third grade will enjoy learning:

APRIL FOOLS

"Shy little pansies tucked away to sleep,
Wrapped in brown blankets piled snug and deep,
Heard in a day-dream a bird singing clear:
'Wake, little sweethearts; the springtime is here!'

"Glad little pansies, stirring from their sleep,
Shook their brown blankets off for a peep,
Put on their velvet hoods, purple and gold,
And stood all a-tremble abroad in the cold.

"Snowflakes were flying, skies were grim and gray,
Bluebird and robin had scurried away;
Only a cruel wind laughed as it said,
'Poor little April fools, hurry back to bed!'

"Soft chimes a-quiver, dark eyes full of tears,
Brave little pansies, spite of their fears,
Said, 'Let us wait for the sunshiny weather;
Take hold of hands, dears, and cuddle up together.' "

Fourth grade pupils will be able to understand and enjoy the German legend of the *Cruel Stepmother* as shown in the parts of the pansy blossom. This is best comprehended with the flower in hand.

Pupils of higher grades enjoy the following stanza:

"Take whatever God sends,
As the blossoming pansies do.
He clothes them with royal grace;
Shall he not take thought for you?
Trust—for the trustful heart
Knoweth the tenderest leading,
Knoweth how certainly God
Our need and our craving is heeding."

16. The Study of Trees.—It often happens that the larger boys of a school, and sometimes the larger girls, seem indifferent to the study of plants in general. When such cases are found, it is best not to press the subject upon these pupils at first. Set them to studying the trees about them. These are large enough to seem worth while.

17. Plan.—Assign a special kind of tree in the neighborhood to each of the older pupils. Have each learn its striking characteristics, the soil upon which it best thrives, the care it needs, the names of its nearest relatives, what its usefulness is to man in regard to ornament, shade, shelter, natural products, fuel, lumber and other products. Also ascertain and become familiar with the varieties of the family elsewhere to which the tree belongs, telling where each variety is found, how it differs in all essential features from the particular tree assigned at first.

Require the pupils to write accurate descriptions and draw the trees thus studied as wholes, both without leaves and with leaves. Draw a leaf of each, a branch of each, the trunk of each. Study the roots as far as possible and read to supplement what cannot be learned from observation.

Continue the study of trees until the common varieties in the neighborhood can be quickly recognized, named and accurately described as to general appearance, habits and uses.

Supplement and illustrate these lessons by making a collection of small pieces of wood, enough to show all the ordinary kinds used in house building, making furniture, etc. Encourage the boys to become acquainted with local carpenters, boat builders, cabinetmakers and other craftsmen who work in wood. From these, good specimens can usually be secured. These specimens need not be more than four inches long by two inches wide, and should show the grain and other characteristics of the wood. Let the pupils polish and label these and place them in the school cabinet for future reference.

After such an introduction to trees, the most indifferent boy will become interested and will take up without urging the study of grains, grasses, edible fruits and roots, medicinal and other plants, and, in many cases, will become enthusiastic.

Fortunately, such study may be pursued outside of the school and with but little help from the teacher beyond the outline of work, a suggestive question or remark now and then to direct research, and a list of helpful books to supplement personal effort. Reports may be given orally for the benefit of the school as a feature of the opening exercises, morning or afternoon, with blackboard illustrations, or these reports may be given in writing to add interest to the special exercises for Friday afternoon.

The oldest pupils in school readily undertake these forms of nature study, because they at once see the practical value of the knowledge gained. They may not so easily see that by means of this line of personal research all their mental powers are quickened and strengthened, thus making all other lessons easier to understand. Should such be the case, do not waste time in argument. Be content to know that results are gained that will be helpful through life.

18. The Recognition of Deciduous Trees.—There are several distinct ways by which trees may be recognized:

(*a*) IN SUMMER. (1) *General Appearance.* Notice size; manner of branching; shape of the branching portion; general outline.

(2) *Bark.* Notice whether it is smooth, rough, deep-ridged or seamed, thick, thin, and its color.

(3) *Leaves.* Notice their size, shape, color, margins, manner of growth.

(*b*) IN WINTER. Notice (1) the size of the tree and size of the trunk; (2) the manner of branching; (3) the outline as seen against the sky.

19. Recognition of Common Evergreens.—(*a*) PINES. All have needle-shaped leaves bound together by a sheath at the back.

(1) *Black Pine.* Leaves three to five inches long, in groups of two, short sheaths.

(2) *White Pine.* Leaves three to four inches long, in groups of five.

(3) *Yellow Pine.* Leaves three to five inches long, in groups of two or three, long sheaths.

(4) *Scotch Pine.* Leaves one and one-half to two and one-half inches, in groups of two, short sheaths.

(*b*) SPRUCES. (1) *In General.* Leaves are short needles, somewhat four-sided, point all ways, are not clustered.

(2) *White Spruce.* Cones two inches long.

(3) *Norway Spruce.* Cones five to seven inches long.

(*c*) HEMLOCKS. Leaves flat, narrowed to short stem, arranged on opposite sides of twigs, appear to be two-ranked.

(*d*) FIRS. Leaves like hemlocks, but with no stem.

(*e*) ARBOR VITAE. Trees with flat branches and with small overlapping leaves, closely pressed against branches and of two kinds, one sharp pointed, the other scale-like and blunt. The most common species, American arbor vitae, has a pleasant aromatic odor.

The wood of each species of tree has distinct characteristics of grain, color and hardness, and when trees are manufactured into various forms of lumber, such as boards, plank, square timber, shingles and lath, a lumber expert can instantly recognize each kind. These distinctive traits appear somewhat different when the wood is planed and polished, but the essential characteristics remain the same and it does not take long to learn the different kinds of woods, whether polished or in the rough.

After the pupils learn ready recognition, there may be given lessons to test relative flexibility, toughness of fiber, degree of hardness, etc., leading to other lessons showing the uses to which each kind of wood is best adapted.

Such lessons may be taken as a separate branch of study or they may be brought in as incidentals to the study of geography, commerce, manufactured wooden wares, ship and boat building and other occupations. They will lend great interest to these subjects and convert them from dull, bare statistics into matters full of vivid life and action.

20. To Lend Interest to the Study of Evergreens.—The following paragraphs from *Primary Education* contain a number of very practical suggestions which the teacher may profitably use:

> In the spring you may find on the ends of evergreen twigs fragile catkins, which shed clouds of pollen. This pollen floats in the air to tiny rigid cones with ovules at the bases of the scales. Each ovule which receives a pollen grain may later become a seed. Dried and crumbled pollen catkins are almost always to be found among the leaves of evergreen trees.
>
> The berry-like fruits of the red cedar are modified cones in which the scales have become fleshy, and so envelop the seeds. They have a spicy taste and are used to flavor gin. These berry-like fruits are eaten by birds, and as the hard coated seeds are dropped by the birds as they sit on fences, it is a common thing to find young cedar trees following the fence lines of Jersey farms.
>
> As an introduction in teaching the lesson, exhibit from your desk a quantity and variety of material; at the same time tell the children where and how you procured it. Aim to make the introduction as inspiring as possible, by mentioning such items as, first, the use of evergreen trees for Christmas; second, for a shelter to deer and other wild animals during snow-storms; third, as a hiding place for little birds during windy weather. Tell how the hunters improvise huts and beds of the green boughs, and how the tall tree trunks are used for masts and flag-poles.
>
> If the twigs have gum on them, tell the children that the tree uses the gum to cover over cuts and broken limbs so that they will heal

before insects and harmful plant diseases can attack the wound. Men gather the gum and make turpentine and some kinds of tar from it.

21. Planting Trees.—The teacher should lead the older pupils to develop an interest in planting trees, and they should be encouraged to plant each spring one or more, either on the school grounds or at home. Under the title *Kinds of Trees to Plant*, the United States Department of Agriculture gives the following valuable information about planting trees on school grounds:

(*a*) HARDY TREES. The first rule to lay down is to plant only the kinds that are known to be hardy. A school-ground plantation is no place for experiment. Naturally the trees will have to endure greater hardships than those of a private plantation; they will be likely to have less cultivation and be subject to more abuse. No matter how strict the rules, the soil about them will be more or less trampled, and twigs will sometimes be broken from their tops. Any tree that cannot endure moderate abuse of this kind should not be given a place on the school ground.

On account of difference in the soil, a tree that thrives in one place in a locality may not thrive in another place. Sandy soils and clay soils are often found near together, and trees that grow thriftily in sandy soil may have a hard struggle to exist when planted in clay. For this reason both the soil and the subsoil of the school ground should be carefully examined, and a list should be made of trees in the neighborhood that are thriving on soils of the same character, and no other species should be used. Much better success may be expected with a soil and subsoil of a porous character than with one that is tenacious and impenetrable. Yet a careful study will show numerous species adapted to each kind of soil.

(*b*) TREES EASILY OBTAINED. Elms, oaks and maples are to be had almost anywhere, and are easily transplanted. They are as beautiful as any trees to be found, and are in every way well adapted for the school ground. They grow on a great variety of soils, and can be easily raised from seed if young trees are not available. Every region will afford other valuable sorts, such as beeches, chestnuts, walnuts, ashes, pines or spruces. From these and such other desirable kinds as the locality affords, the selection should be made.

22. Reviews.—Reviews of trees, shrubs, weeds, flowers—any kind of plant growth that has been studied—may be conducted easily and happily if pupils are assigned topics for personations.

(*a*) A GOOD PLAN. On a given day, the teacher distributes slips of paper among the pupils, each slip being numbered and bearing the name of a tree. By the time all of the slips are distributed, the pupil having No. 1 is ready to recite. He may come before the class or stand by his seat and give a description of his tree as follows: "I am an evergreen, a native of the United States. I grow very tall, have a long, straight trunk that branches a good many feet from the ground. My leaves are needle-shaped, three to five inches long, in groups of two or three. My wood is used for finishing houses and for furniture." Have the pupils give name. (Yellow pine.)

On other days, names of shrubs, flowers and fruits may be distributed and the same general plan followed.

(*b*) A SECOND PLAN. For written reviews, slips are distributed, descriptions written and left without the name of the plant. Then the papers are exchanged, each pupil adding the name of the plant to a classmate's description.

As a rule, it is better to keep to the oral descriptions, since the writing takes more time than can usually be spared. All can participate in the oral exercise, and these personations soon give a fluency in the use of language that other exercises fail to impart, probably because there is less self-consciousness, since the exercise is in the nature of a game with little formal restraint.

(*c*) A THIRD PLAN. Reviews may also be conducted by means of drawing. Numbered slips with names of trees, flowers, leaves, etc., may be rapidly distributed. The pupils pass to the board, each pupil drawing freehand, from memory, what his slip demands. When the drawing is finished, the pupils take their seats. Other pupils then pass to the board and write the correct name under each drawing. "This is a sugar maple tree." "This is a willow tree." "This is a locust leaf." "This is a violet." "This is a sweet pea." "This is a lilac leaf."

(*d*) A FOURTH PLAN. Send all the pupils to the board at once, let them draw and then, without naming the object, change places, after which each may write the name of his neighbor's drawing.

No plant should be assigned that has not been previously studied carefully. Announce in advance the day for such a review. Much of the study is outside of school hours and the pupils need time for extra practice on the drawings. These reviews may be, and at first should be, limited to one subject, as leaves, trees, flowers.

After leaves have been studied thoroughly, the older pupils will get a valuable review by answering questions like the following:

Name leaves longer than they are wide. Name those wider than they are long. Name leaves usually less than three inches in length. Name those usually more than three inches in length. Name leaves that are alternate on the stem. Name those that are opposite on the stem. Name plants that have simple leaves. Name those that have compound leaves. Name leaves more than a foot long.

Prepare as many questions as are necessary to cover the plants studied and, to make the test complete, have a drawing made to illustrate each answer given.

23. The Apple.—After the apple tree as a whole has been studied thoroughly, including buds, blossoms, fruit and seed, kinds of apples, uses of apples and everything of interest that can be discovered, then as a review present:

"*Nine Things to Learn from an Apple:*[1] (1) How much of an apple is occupied by the core?

(2) How many compartments in the core?

(3) How many seeds in each compartment?

(4) Do the seeds point to the flower or the stem end?

(5) Are the seeds joined to any part of the core?

(6) What do you see in the blossom end of an apple?

(7) What do you see in the stem end?

(8) Is there any connection between the blossom end and the core?

(9) Examine a wormy apple and find where the worm left the apple. Make a drawing thus:

(*a*) Cut the apple in two.
(*b*) Press the cut surface on a piece of paper.
(*c*) Remove the apple from the paper and trace the marks showing the worm's path."

For the information of the school, give the following account:

> "The first apple crop grown in the new world was in Massachusetts, in and around Boston. In 1625 or 1626, the Rev. William Blackstone had an orchard on the west slope of Beacon Hill. Governor Endicott established nurseries in Salem as early as 1628, and in 1648 sold five hundred apple trees to William Trask for two hundred and fifty acres of land. Governor Winthrop was very prominent in horticultural matters as early as 1630, having land on the Mystic River and a garden at the foot of School Street, and also another one at Governor's Island. The Colonial Legislature granted him the use of this island for a rental of two bushels of apples, one for the Governor and one for the Legislature."[2]

For literature to accompany the study of apples, see The Cellar Scene in J. G. Holland's *Bitter-Sweet;* Andersen, *The Conceited Apple Branch;* the chapter on Apples in *Winter Sunshine*, Burroughs; *The Golden Apples of Hesperides*, *The*

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[1] From Prof. L. H. Bailey, Cornell University.

[2] *Primary Education.*

Apple of Discord and *Apple-seed John*, Book IV, Part One, *Sprague Classic Readers; Idun's Apples*, from the Fifth Reader, *Stepping Stones to Literature; Planting the Apple Tree*, by Bryant; *Atalanta and the Apples;* and memorize this poem:

WINTER APPLES

"What cheer is there that is half so good,
In the snowy waste of a winter night,
As a dancing fire of hickory wood,
And an easy chair in its mellow light,
And a pearmain apple, ruddy and sleek,
Or a jenneting with a freckled cheek?

"A russet apple is fair to view,
With a tawny tint like an autumn leaf,
The warmth of a ripened cornfield's hue,
Or golden hint of a harvest sheaf;
And the wholesome breath of the finished year
Is held in a winesap's blooming sphere.

"They bring you a thought of the orchard trees
In blossoming April and leafy June,
And the sleepy droning of bumble-bees,
In the lazy light of the afternoon,
And tangled clover and bobolinks,
Tiger-lilies and garden pinks." - *Hattie Whitney.*

The Cellar Scene from *Bitter-Sweet* may be easily dramatized and given as a pleasant feature of an evening school entertainment. No scenery or special costumes are needed.

24. The Cranberry.—The following suggestions on the study of the cranberry are from *The Plan Book*, by Marian M. George (A. Flanagan Company).[1] In a general way, this plan may be used when the pupils study other fruits. It contains not only a good plan for the lesson, but shows the relation of nature study lessons to other subjects.

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[1] These books can be obtained in sets suitable for the seasons of the year. The set for autumn includes the September, October and November numbers; the winter set, December, January and February numbers, and the spring set the numbers for March, April, May and June. Price for the autumn and winter sets, $1.25 each; for the spring set, $1.50; for the entire set of ten numbers, $3.50.

(*a*) MATERIAL. A dish of cranberries and a blackboard sketch of the plant.

(*b*) METHOD. (1) *Where Found.* Cranberries grow in marshy land and are found in abundance in New Jersey, Delaware, Massachusetts, some parts of Wisconsin and in a few other states.

(2) *Shape and Size.* The cranberry is shaped like an egg and is about the size of a sparrow's egg.

(3) *Color and Taste.* The skin is usually light red at the blossom end and darker toward the other end. Very often the cranberries are mottled, being red and pink or almost red and white. The flesh is of a creamy white. When cut open crosswise, the berry looks like a full moon with a four-leaved clover in the middle. Cranberries are very sour.

(4) *Seeds.* Each berry has four cavities and when perfect there are four seeds in each cavity. The seeds are attached to a cord that passes through the middle of the berry from end to end, and point toward the stem end. They are fastened together by a red substance.

(5) *Drawing.* Draw or paint the dish containing the cranberries; also a whole cranberry and one cut open so as to show the seeds and seed-cells in position.

(6) *Language.* Have the pupils describe the plant and the fruit and tell how cranberries are prepared for the table and the purposes for which they are used.

(7) *Arithmetic.* Find the cost of cranberries in your nearest market by the quart, gallon or bushel. It is interesting for the older pupils to learn the price received by those who harvest them and the cost of freight from the place where they grow to the market.

25. The Potato.—The following suggestions for the study of this vegetable are offered by Mary Rogers Miller: Hang a potato in a moderately warm room a little to one side of a window, or place it on a plate in a similar position. Watch what happens to it for a month and answer the following questions:

(1) Do the shoots come from the eyes?

(2) What color are the shoots?

(3) What direction do they take, and why?

(4) Do leaves grow on them?

(5) Take a long potato, put a pin in each eye and then pass a thread around the potato from pin to pin. How does this show the buds on the potato to be arranged?

(6) Would you infer that the potato is a root or a stem?

(7) Why do we hill up potatoes when growing them?

(8) If a potato is exposed to the sun when growing, what happens to it?

(9) How does this affect its edibility?

(10) Is there anything in this change from exposure to the sun to show whether the potato is a root or a stem?

(11) Split one eye of the potato lengthwise with a knife. Does this eye send out a shoot? If it does, what do you infer?

(12) In planting a potato, do you plant the whole potato or only one piece that has an eye, and why?

(13) Why do we not commonly grow potatoes from seed rather than from tubers?

(14) What part does the tuber play in the life of the potato plant?

26. Regular Study by Seasons.—For greater convenience, and to give the plant study a more systematic form, it is best to arrange the work in three groups to correspond to the seasons in which schools are in session, viz., spring, autumn and winter. At the close of the spring term, the teacher may give the pupils a small list of plants to observe during the summer vacation. This will keep their interest alive and lead them to collect valuable facts that will be of great help when the study is systematically resumed in September.

27. Suggestions for Spring Study.—(*a*) WILD FLOWERS. Have the pupils search out the home of the skunk cabbage, Jack-in-the-pulpit, trailing arbutus, anemone, blood-root, hepatica, trillium, violet and the other early spring flowers, that grow in the locality. Watch the development of the leaves and blossoms and the general growth of the plant. Bring specimens to school and set them in window gardens, in order to have opportunities for closer study. Have the pupils make drawings of these plants and flowers.

In considering the skunk cabbage, leek, wild onion, etc., bring out the effect they have upon the milk of cows that eat these plants.

Plant beans, peas, squash and corn at home, in a corner of the school yard or in the window garden, and watch the germination of the seeds and the changes in the plant at different stages of its growth. Make drawings illustrating these changes.

(*b*) SCHOOL GARDENS. If possible, convert a sunny portion of the school premises into a garden and plant therein two or more of the following: barley, oats, corn, sugar-cane, wheat, buckwheat, millet, rye and flax, according to locality and age of pupils. Have these tended and their development studied until maturity is reached. Also plant carrots, beets, cucumbers or other common vegetables and watch their growth to maturity.

(*c*) CULTIVATED FLOWERS. Spade up the soil around the trees on the school grounds and plant sweet peas, nasturtiums, petunias, poppies, asters and the late cosmos. Have all these cared for by the children themselves and let the lessons upon them be informal. Note the studies made and begin upon new plants or topics in September.

28. Schoolroom Gardens.—(*a*) WINDOW BOXES. Boxes made to fit the window and filled with leaf mold may be utilized for the planting of seeds for germination; and for holding geraniums or other flowers and vines. For the warm months these boxes may be fastened just below the windows outside, if desired; where they will prove a source of great benefit as well as pleasure.

(*b*) TUMBLER GARDENS. (1) Fill a tumbler with water and tie loosely over the top a piece of mosquito netting, covering the net with sweet peas or the scarlet flowering bean. Keep the tumbler in the dark for three or four days and then place it on the window ledge or on the table by a sunny window.

(2) Use a tumbler or glass fruit can and in place of the net use a piece of cotton batting or thin flannel cut exactly to fit the top. Place this on top of the water, and scatter over it canary, chicory, grass, flax or mustard seeds. Keep the can in the dark for a few days, then bring it to the light. The results are beautiful in both (1) and (2), showing the upward and downward growth very perfectly.

(*c*) A SPONGE GARDEN. Wet a large sponge thoroughly and place it in a glass dish or suspend it in a window above a window box. Sow canary, grass, flax or mustard seeds thickly over it. Keep the sponge wet.

Large pine cones may be similarly used or set in a saucer filled in with green moss. When cones are used, fill them in with soil, sprinkle thoroughly, sow the seed and keep the soil damp.

(*d*) VEGETABLE CUPS. Scoop out the inside of a large turnip, beet, carrot or parsnip, leaving a thick rim all around. Fill the cavity with soil and plant with vines and suspend the cup in the light by strong cords.

A large sweet potato in a vase or hanging basket will furnish a beautiful vine if kept covered with water to within less than an inch of the top. A common red beet, a carrot or a parsnip will produce a pretty growth. Cut the tip off and plant the vegetable in a tin can or anything else that is convenient. Do not cut the top of the plant too close, or the leaves will not start readily. Cover the can neatly.

Caution. It is seldom that conditions are such as to make window gardens possible during the winter months, because the plants are liable to freeze, but they may gladden the schoolroom from early spring until late in the fall and repay all the effort they cost a hundredfold, by their beauty and their aid in studying the unfoldment of the plant from the seed.

29. Suggestions for Summer Work.—Try to get the pupils interested to watch for, study and note the flowers, both wild and cultivated, that bloom during the summer vacation; to watch the ripening and harvesting of the various grains, the growth of garden vegetables, and the gathering of medicinal plants. Call for drawings of and reports upon these early in September, before taking up new lines of plant observation and study.

30. Suggestions for Fall Work.—(*a*) WILD FLOWERS. This is the time to study the goldenrod, aster, gentian, milkweed, thistle, burdock, sunflower, clover, late dandelions and a number of other common flowers.

(*b*) CULTIVATED FLOWERS. During the fall months, any of the late-blooming flowers, asters, chrysanthemums, nasturtiums, cosmos, pansies, sweet peas, geraniums, etc., will furnish abundant material for all grades of pupils to study.

(*c*) SEEDS. This is the best time to study the "seed boxes," the differences in size, color and general appearance of the seeds, seed distribution and means of dispersal.

Refer back to the outlines previously given for seed study, and assign work suited in difficulty to the grade that is to do it. Collect specimens; name them; observe the parts carefully; learn the characteristic features; compare the different specimens, and learn methods of preserving desirable seeds.

In connection with the subject of seeds, carefully study common fruits and nuts.

(*d*) ROOTS. By means of germinating seeds in the spring, the pupils learned the early growth of plant roots. After the summer's work is done, when vegetables are being gathered, there is an opportunity to study roots of full size more in detail. Particular attention should be given to the roots of useful plants, their length, manner of branching, etc., since a knowledge of these facts is essential to successful cultivation.

The roots of trees should be carefully studied when transplanting is done and by visits to nurseries; also, from illustrated catalogues.

(*e*) LEAVES. The spring months give opportunity for so much interesting work that the greater portion of the leaf study may profitably be left to the fall months. The action of the frost upon the leaves makes it possible to correlate a great amount of beautiful color work and color literature with the leaf study, thus increasing the value of both.

Caution. Use the outlines and suggestions already given.

(*f*) PREPARATIONS FOR WINTER. This topic may well occupy a considerable portion of the month of November, especially when carried, as it should be, into the study of animals as well as plants.

Caution. Search the educational papers, school readers, and the writings of standard poets, *Plan Book*, *Month by Month*, *Songs of the Treetop and Meadow*, *Nature in Verse*, *Graded Memory Selections*, *Book of Nature Myths* and other similar works, for appropriate literature.

31. Suggestions for Winter Work. — Usually winter months may be more profitably devoted to other forms of nature study—water, temperature, light, heat, weather records, clouds, animals, etc. Nevertheless, evergreens may be studied in the winter, and additional pleasure is secured when this study leads naturally up to and terminates with the thought, customs and spirit of Christmas.

32. The Ideal to Hold.—Not every teacher, perhaps not many teachers, will be able to direct the work in nature study so successfully that their pupils will find "sermons in stones, tongues in trees, books in the running brooks and good in everything." Yet that is the true ideal to hold. There should be no discouragement, however, over slow progress and imperfect results.

33. Tests of Success.—Be satisfied when you find that interest in nature in its varied forms is growing and deepening, that the work is showing more of spontaneity, more of earnestness, that specimens are voluntarily brought and questions asked from a desire for information; in short, be sure that you are working along right lines when all the common things of the child's natural environment become, little by little, of interest to him and he shows that he is finding his proper relations to these and his right place among them.

34. Conclusion.—Surrounded by a world full of interesting material, the constant temptation is to try to teach too much to the primary pupils and to crowd too many things upon their attention at once. Arouse their interest, encourage constant observation, direct the work that the children do, but conscientiously refrain from doing the work for them; that ruins the whole purpose of the lessons. Lead them, step by step, to see new beauties and find new wonders every day, but let the steps be short and easy, or weariness will come and interest will die out.

35. References. — Miss Arnold's lesson outlines in *Waymarks for Teachers*, pages 78 and 79, give a good general outline of plant lessons for the first six grades of school.

On page 36 of the same book, *Study of Thistles* is typical of the amount and kind of plant study best suited to primary pupils.

For carefully prepared and very complete lessons on wheat, corn, the apple and the oak, see Miss George's *Plan Book*, volume three, *October*. *Plan Book*, volume three, *September*, has a typical primary lesson on *The Aster*.

Many states publish Arbor Day manuals full of excellent material and abounding in helpful suggestions. Apply to the State Superintendent of Public Instruction for copies.

36. Bibliography.—(*a*) HELPFUL LITERATURE ON TREES.

Apgar, *Trees of the Northern United States*, American Book Company, Chicago	**$1.00**
Flagg, *A Year Among the Trees*, Educational Publishing Company, Chicago	1.00
Newell, *Outlines of Lessons in Botany:*	
Part I, *From Seed to Leaf*, Ginn & Co., Chicago	.50
Part II, *Flower and Fruit*, Ginn & Co., Chicago	.80

(*b*) BOOKS TO AID GENERAL PLANT STUDY.

Arnold, *Waymarks for Teachers*, Silver, Burdett & Co., Chicago	**$1.25**
Dana, *How to Know the Wild Flowers*, Charles Scribner's Sons, Chicago	2.00
Dana, *Plants and their Children*, American Book Company, Chicago	.65
Gray, *How Plants Behave*, American Book Company, Chicago	.54
Gray, *How Plants Grow*, American Book Company, Chicago	.80
Hale, *Little Flower People*, Ginn & Co., Chicago	.40
Herrick, *Chapters on Plant Life*, American Book Company, Chicago	.60
McMurray, *Special Method in Natural Science*, Macmillan Company, Chicago	.75
Matthews, *Familiar Flowers of Field and Garden*, D. Appleton & Co., Chicago	1.40
Payne, *One Hundred Lessons in Nature Study*, A. Flanagan Co., Chicago	1.00
Agriculture for Beginners, Ginn & Co., Chicago	.75

Pratt, *Fairyland of Flowers*, Educational Publishing Company, Chicago	$1.00
Rogers, *Under the Greenwood Trees*, A. W. Mumford, Chicago	3.00
Youman, *First Book of Botany*, American Book Company, Chicago	.64

TEST QUESTIONS

1. Show how nature study secures respect for the different forms of labor and industry.

2. What is the relation of nature study to sense-training? What is the relation of nature study to drawing?

3. What plants grown in the United States furnish material for clothing? In what section of the country is each the most extensively cultivated?

4. Why, in the primary grade, can you not attempt the same line of work with the fall flowers that you can with the spring flowers? What lessons on seeds can you give that will interest pupils of this grade?

5. Why are frequent reviews necessary? How can these be so conducted as to secure the desired results, and at the same time retain the interest of the class?

6. How many trees can you recognize by their bark alone? Name them. How many by their leaves alone? Name them.

7. Give a plan for transplanting a tree, including preparation of the ground, removing the tree from the place where it stands and setting it in the place prepared for it.

8. What trees of the United States are the most valuable for lumber? In what localities is each found?

9. What insects are injurious to wheat? to the apple? to the peach? Do you know how to prevent ravages from these insects? If not, where can you obtain the desired information?

10. What results would you expect to obtain from a school garden? How would you conduct such an enterprise?

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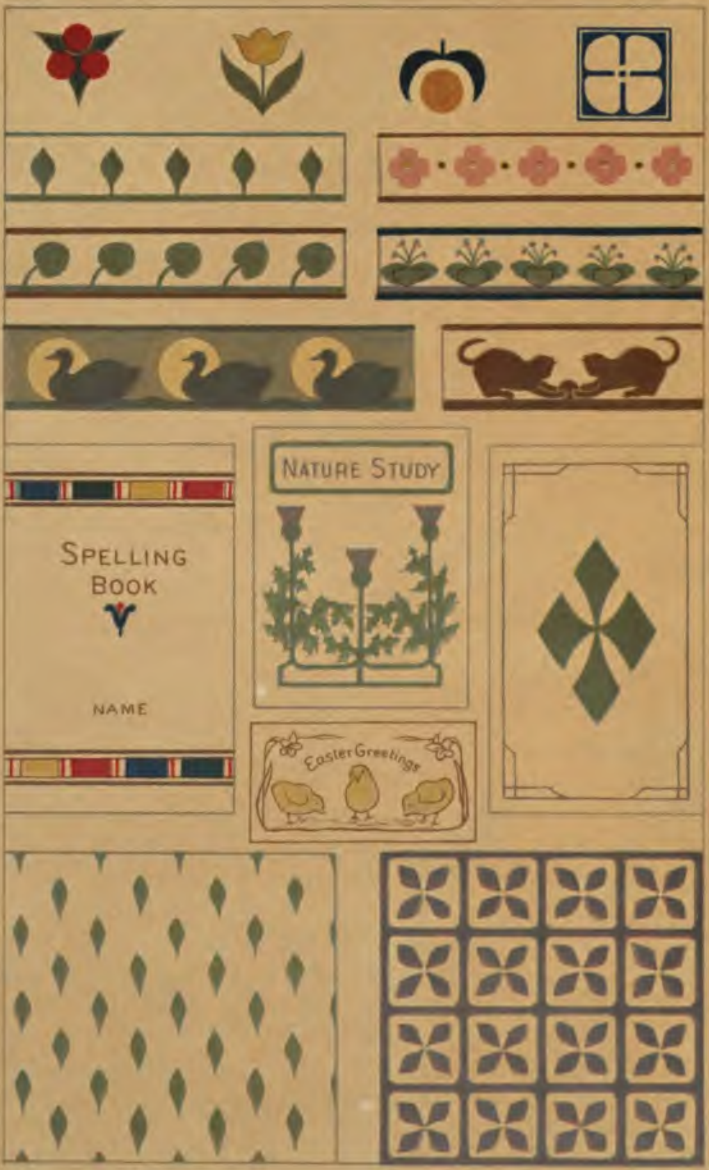

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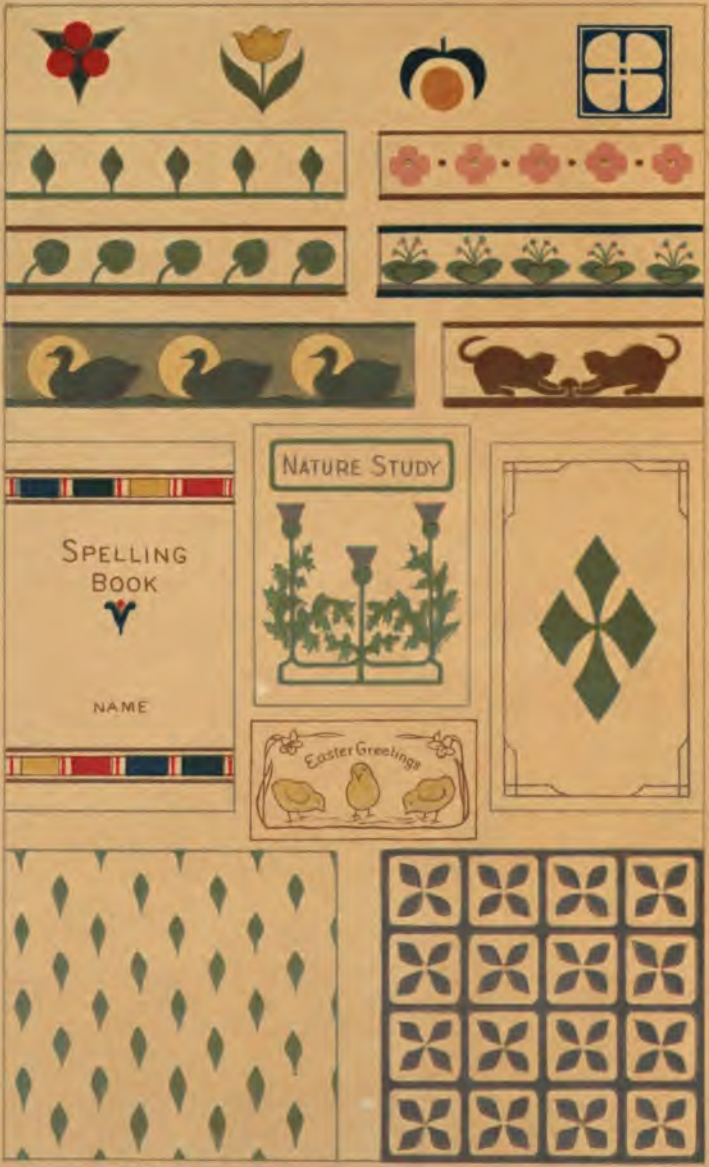


Plate V

literature presented. The work upon which we should concentrate our attention must be determined somewhat by the locality in which we live.

3. Conditions Contrasted.—Pupils in city schools have opportunities to see horses, mules, dogs, cats, and occasionally a few other domestic quadrupeds. By going to the parks that maintain a zoo, the children may see, at close range, lions, tigers, bears, elephants, monkeys and many other wild animals. By visiting the museums, they may see stuffed specimens of many foreign quadrupeds, all sorts of birds, insects, reptiles, fish—including species now extinct—in fact, every phase of animal life. Moreover, in the parks are many native wild birds and some wild animals. The schools frequently are supplied with colored charts and other forms of apparatus for teaching natural history.

Pupils in the small towns and in rural districts are deprived of many of the opportunities which are within the easy reach of pupils whose homes are in large cities. On the other hand, they see intimately the animal life around them. Their knowledge thus has the exactness that long association gives. They not only recognize at sight the quadrupeds of their vicinity, but are able to tell their characteristic traits, where they live, upon what food they subsist and how and where they find food and shelter.

This is especially true of the domesticated animals. Of cows and their value to man, country boys and girls can speak with full knowledge. In the city, children never see cows, know milk only as it is delivered in bottles or cans, and butter and cheese only as they are found on the table or at the grocer's. Similar statements may be made as to the relative knowledge in regard to sheep, oxen, swine, poultry and even dogs and cats.

Of hornets, wasps, honey-bees, bumble-bees, woodchucks, moles, field-mice and other animals in their wild state, the city children know nothing, while, in the country, there are still many to be found who share the knowledge of Whittier's famous *Barefoot Boy*—but not all of them have his kindly disposition. The problem is to awaken in both city and country those who see little and care less; to give the knowledge most needed by the children, wherever their homes may be; above all, to create so deep and abiding an interest in nature that pupils will be induced to get knowledge at first hand, from which they will understand something, at least, of the unlimited scope of creation, its endless diversity and the interdependence of its manifold classes.

4. Preparation Needed.—Before the teacher attempts to include natural history as a regular part of her teaching, she needs first to have a fairly good knowledge of those forms of animal life that are accessible in the neighborhood of her school. The second step is to decide where and when to begin, and to determine what part of the work to apportion for outside observation and what to make a part of the regular school routine.

The mode of introduction should be informal, but a systematic plan should underlie the work. The apparatus needed has been indicated in the previous lesson.

Few teachers know natural history definitely enough to teach it without the assistance found in books; therefore, we append a reliable list of excellent books that should go into the school library as an aid to the work of the teacher and as a means of verifying the observations of the pupils.

Caution. No teacher should make the lack of apparatus or the lack of personal knowledge an excuse for omitting this line of work. The important thing is to have a genuine interest in the subject and to be willing to learn with the pupils from the illustrations on every hand.

I. BIRDS

5. Importance of Bird Study.—"When God wanted a beautiful thought in the air, he molded it into the shape of a bird." Boys and girls in the primary grades of both city and country schools know but little of birds, and never dream of the important part they play in the great scheme of creation; but at the present time, school officers and other citizens are becoming informed as to the value of bird study and better results are obtained from instruction. Public opinion, prompted by a better knowledge of bird values, has ruled against collections of eggs and nests except for museums to which pupils and parents alike have access. Even for these collections public sentiment rules against more than one egg being taken from a single nest, and discountenances taking any nest till after it has been abandoned as a bird home.

The reason for this change of sentiment may be traced to (1) the patient study and experiments of scientists connected with the United States Department of Agriculture; (2) the efforts of the American Ornithological Union; (3) the work of the Audubon societies, especially the formation of such among the children of primary and intermediate grades of schools; (4) to state and county horticultural societies; (5) to the wanton destruction of some of our most delightful song birds for mere practice in "wing shooting" or to give exercise to air guns and "bean shooters"; (6) the rapid extinction of birds of beautiful plumage for millinery purposes; (7) the coöperation of the press to make the general reading public acquainted with the facts relating to the economic value of birds as these were obtained by public or private research; (8) the instruction concerning the real food of birds given to farmers and fruit-growers by agricultural associations and at farmers' institutes; (9) the intelligent and systematic work of school superintendents and teachers.

6. **Protection of Birds.**—There were in 1905 only five states and territories whose laws afforded no protection to the birds, and work for the securing of protective measures where they are lacking will soon be undertaken with the backing of the United States Department of Agriculture. We may add that for an individual to know any bird well is to become its protector thereafter, except in a very few instances where the birds are really destructive.

7. **Bird Food.**—"An unfortunate popular error greatly magnifies the injury done to the crops of grain and leguminous vegetables by wild birds. Very many of those generally supposed to consume large quantities of the seeds of cultivated plants really feed almost exclusively upon insects, and frequent the wheat fields, not for the sake of the grain, but for eggs, larvae and fly of the multiplied tribes of insect life which are so destructive to the harvests. This fact has been so well established by the examination of the stomachs of great numbers of birds in Europe and the United States, at different seasons of the year, that it is no longer open to doubt."—*Illinois Arbor and Bird Day Manual for 1905.*

"Birds have different tastes from men; as a rule, they prefer bitter, sour or insipid fruit. We should never destroy such plants as the wild cherry, wild grape, elder, hackberry, Juneberry, mulberry, dogwood, Virginia creeper, buckthorn, sumach, bitter-sweet and others. I believe by encouraging such plants we are approaching a solution of the problem that will preserve for our own benefit both the cultivated fruit and the birds."—*Birds in Horticulture*, William E. Praeger.

The following important facts relative to the food of birds often supposed to be distinctly injurious to farmers and fruit-growers are taken from the most reliable authorities, and should enable the teacher and pupils to do much towards removing a prejudice that in some states has led to the extermination of certain birds—only to be followed by their speedy re-introduction and protection after a bitter lesson had been learned.

(*a*) THE ORIOLE. This bird is called a destroyer of fruit, especially grapes. In the stomachs examined were a few raspberries and no trace of grapes. Over four-fifths of the oriole's food consists of insects, mostly those injurious to vegetation, more than one-third being caterpillars.

(*b*) THE CEDAR BIRD, WAX WING OR CHERRY BIRD. This bird makes but one-twentieth of its meals on cherries, and yet it probably eats more fruit than any other bird of the central western states. During a plague of canker worms, seven cedar birds were shot and the stomachs were found full of canker worms, averaging about one hundred worms to each. At this rate, during the month when the canker worm prevailed, not less than ninety thousand worms would be destroyed by a flock of thirty of these birds.

(*c*) THE BLUEJAY. The blustering bluejay is a friend to the orchard. Rarely he robs the nests of other birds and he eats but little fruit. He likes acorns, beechnuts and chestnuts better; and grasshoppers, caterpillars and beetles form one-fourth of his entire food.

(*d*) THE CATBIRD. More than half the food of the catbird is of beetles, ants, grasshoppers and other insects. Less than one-fifth is fruit, chiefly raspberries and blackberries. Along the seacoast this bird is regarded as purely beneficial. Wild berries are plentiful there, but less abundant in the prairie states of the middle West.

(*e*) THE ROSE-BREASTED GROSBEAK. This bird is partial to the potato-bug as an article of food and will prey upon it as long as it can be found.

(*f*) CUCKOO OR RAIN CROW. This bird feeds by choice upon the woolly caterpillars that are entirely safe from many birds.

(*g*) THE COMMON CROW. This species of crow has a strong bill and breaks clods and turns over sticks and stones in search of grubs beyond the reach of smaller birds.

When a plague of Rocky Mountain locusts visited the West, it was found that practically every crow of the region was feeding upon them.

(*h*) WOODPECKERS. These birds are accused of injuring the bark of trees, stealing fruit and robbing nests of other birds. All this is done, yet five out of the six common species peck wood only to get at an injurious insect within. The hairy and downy woodpeckers and the flicker are highly valuable, and the zebra woodpecker is but little less so. The red-headed woodpecker destroys great numbers of insects, far more than enough to balance the injury it does by pecking apples or other fruits. The yellow-bellied sapsucker is the most injurious of this family.

(*i*) THE MEADOW LARK. This bird is very beneficial. Of its food, nearly three-fourths is animal and about one-fourth vegetable, the most of the latter being the seeds of weeds. As a destroyer of grasshoppers alone, each meadow lark is estimated to be worth $1.20 per year to the farmer.

(*j*) CROWS AND BLACKBIRDS. Even these birds, which delight in stealing the farmer's corn and wheat in the spring, for the greater part of the year are truly his friends, and all in all fully pay for all the grain they take.

(*k*) ROBIN. Farmers, gardeners and fruit-growers even yet are prone to look upon our cheerful, bold, saucy, altogether-friendly robin with suspicion; hence investigators have put him severely upon trial, to learn that when he comes north and finds winter weather, he eats the seeds left upon last summer's shrubs, vines and weeds. When the snow is gone, he eats fly-larvae, and later, larvae of beetles, grasshoppers and other ground insects. In March, one-fifth of his food is cutworms; in April, he eats more beetles. Till the end of May, and sometimes later, more than nine-tenths of his food consists of insects. Cultivated fruit is eaten to any serious extent only during June and July. The fruit eaten later is mostly wild berries or waste fruit left by the grower as worthless. In August, over a third of his food is grasshoppers and crickets. Harmful beetles—whose larvae are "white grubs"—moths, butterflies, bees, wasps, ants, bugs, aphides, army worms and other forms of animal food help to supply his table. All in all, the most careful statistics prove that the balance is decidedly in the robin's favor for economic purposes, to say nothing of the jolly comrade he becomes to man whenever permitted, and the cheery music he is ever ready to furnish.

Lack of space forbids our prolonging this interesting list. Fortunately, bird literature is now so abundant that all needed facts are easily obtainable from the books in the list appended.

It being now possible to learn what foods the wild birds prefer, it remains with the fruit-growers to protect their fruits by supplying such food as will, practically, make their own immune from the birds. Mr. Praeger offers the following practical and inexpensive suggestions as an insurance for cultivated fruits:

"Were a supply of berries, of kinds worthless to us but prized by the birds, at hand, the pressure on domestic fruits would be greatly relieved. If a few trees of the Russian mulberry were planted, preferably in our hen yards or hog runs, the chickens and hogs would appreciate them, and they would produce plenty of fruit and offer robins and catbirds a supply of food just when our cherries are ripe. Later in the season, wild berries are more abundant and garden fruits suffer less. At this season water is often scarce and fruit juices may be the best substitute obtainable. It has been found that it is in years of drought that the fruit, especially grapes, suffers most."

8. **Recognition of Birds.**—Birds may be recognized by their characteristic features, among which are size; shape; color of plumage; mode of flight; song or call; kind of beak, tail, feet, food; time, place and manner of nest-making; size, color and number of their eggs; care of the young; number of broods in a season; time of arrival, time of departure; social or solitary habits; changes of coat; changes of song; flying by day or night.

When an exhaustive study of any bird is undertaken, all these points should be ascertained by long and careful observation in the open air; the observations should be recorded and compared with the best printed authorities. Local conditions will account for any small differences.

(*a*) WHEN TO BEGIN. Birds might be studied during the entire year with much profit and pleasure, did not other things interfere, since some birds remain during the winter, even in the coldest of our states. From the beginning of March, through April and till the twentieth of May is the period of the spring migration. The last week in April and the first two weeks in May will show the greatest numbers of transient visitors. This is before the leaves grow large, and here the opportunities for observation are greatest. At least a hundred different species may be seen by the careful observer during the migration period.

For fall study, select September and early October, for then the birds return South. The study may continue later, if there is a desire to make a special study of the last birds to depart.

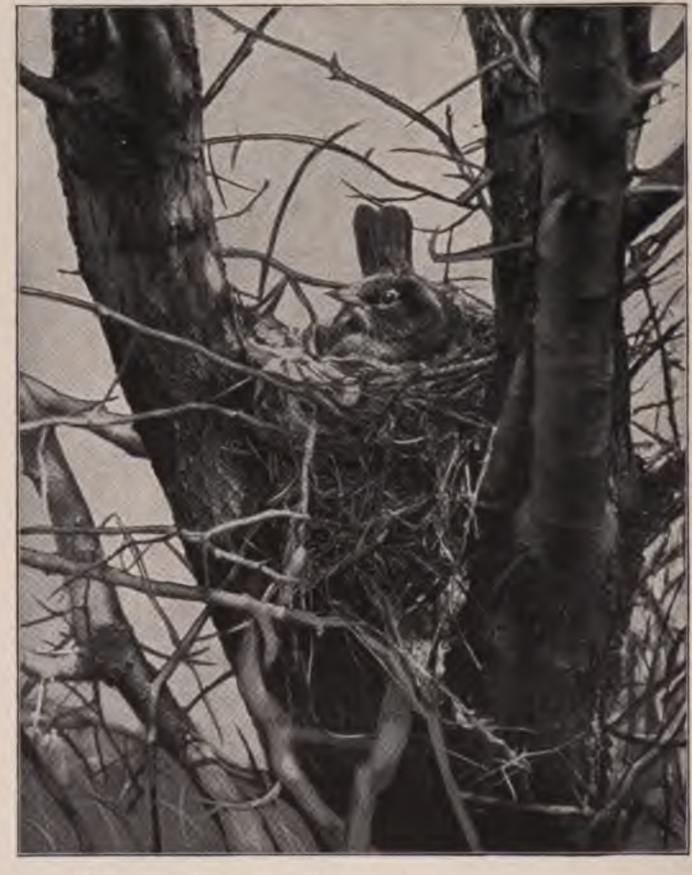
(*b*) WHERE TO BEGIN. With children of the primary grades, it is always best to begin with some bird that they already know by sight or with one that is of itself particularly attractive in plumage or by reason of its personal qualities. The robin is a general favorite in all of the northern states and is more easy for children to study, because of its social qualities and its tendency to nest near to the homes of man.

(*c*) PLAN. On a large sheet of manila paper write a list of questions that may be answered from observation and keep it where the primary classes may see it easily. Let all members of the primary grades work on this list, bringing in as many facts as they are able. These will vary according to age, experience and opportunity. Let the pupils of the second grade and above, make "bird records," briefly reporting the main facts learned.

Pupils of the first two grades should report orally, as a rule, and the material thus gained should be used for other lessons before suggested.

Caution. Work chiefly to arouse a friendly interest in birds and to lead the children to acquire facts from personal observation.

9. The Robin.—(*a*) QUESTIONS. When was the first robin seen this year? Where was it when you saw it? Did it come alone or with other robins? What food have you seen it eat? What food does it choose for itself? What color is its coat? Its breast? How large is it? (The eastern robin is from ten to eleven inches long; the western is a little larger and a little darker in color.) Where does it make its nest? Of what does it build? Do both birds help build the nest? What is the shape of the nest? Of what is the lining made? How many eggs are there? What is their color? How long before they hatch? How many broods of young are raised in a season? Who feeds the young? What is the food of the baby birds? Do the parents give singing lessons? Are there flying lessons? Does the robin fly high and far? Does he walk or hop on the ground? At what time of day does he sing? Does he



THE ROBIN'S NEST
A photograph from life.

ever sing when it rains or snows? Is the nest used more than one year? Who are the robin's enemies? Who are its friends? Why should the robin be protected? How may you help the robins? (By scattering crumbs when food is scarce; by hanging out bits of suet; by putting water, threads, hair, etc., where they can find them; by never frightening them or robbing the nests.) How may you learn about the nest and eggs without disturbing the birds? What is the date of the robin's departure?

To answer all these questions will require outdoor observation during several months. Meantime, other more or less familiar birds may also be under observation and notes made and used the same as for the robin. Vary the observations and notes according to the age and interest of the pupils.

(*b*) LITERATURE. Our best educational journals, our school readers, books of bird stories and poems, collections of natural history anecdotes and collections of nature poems in general will furnish abundant literature that is appropriate to use with all the lessons on natural history. The sources are so numerous that the teacher has only to choose what is really worth while to hear, read or memorize, and see that it is suited to the age and advancement of the pupils.

Cautions. 1. Children have so intense an interest in live things that the teacher can easily make these lessons in every way valuable by (1) preparing herself thoroughly as to facts, (2) by directing the interest of the children into legitimate and useful channels, (3) by making herself an enthusiastic student with the pupils.

2. Before the study of the robin is concluded, tell the school stories of the treatment it receives in the South, where it is thought of merely as a bit of choice food. There this bird has neither law nor affection to protect it. In central Tennessee there are large tracts of cedars in which multitudes

of robins find winter shelter. One little hamlet of that region sends one hundred twenty thousand robins to market each year. In Louisiana, the number killed in a year sometimes reaches a full million. And this in winter time, when cultivated fruits are not in season and no charges of robbery can be preferred.

3. Be sure to teach the economic value of the robin according to statistics given earlier in this lesson.

10. The Meadow Lark.—Like the robin, the meadow lark is generally distributed over the United States, from the Atlantic to the Pacific. It is a familiar bird, much prized for its song and for its immense economic value. In the latter respect, it outranks nearly all other birds of the meadow and prairie lands. Its favorite food is insects, which for six months of the year form over nine-tenths of its food, and during August and September a still larger proportion. The remaining portion consists of weed seeds and grain gleaned from the stubble fields in January, February, March, April and December. For other food statistics, see remarks on page 423. For a full description of the meadow lark, see *Educational Leaflet No. 3*, *National Committee of Audubon Societies.*

To study the meadow lark with the children, use the same set of questions as for the robin, but explain the need of going farther afield.

11. The Flicker.—The flicker belongs to the woodpecker family, and yet he is as much terrestrial as arboreal in his habits. His traits are so numerous and individual that many sections have given him a local name expressive of some peculiar characteristic. One compiler reports one hundred twenty-four of these neighborhood names. You may know him by the name of yellow hammer or golden winged woodpecker, or possibly by the inappropriate and libelous name of sapsucker.

The flicker is a most welcome accompaniment of spring and a most noticeable one. His strong voice, heard in jovial and varied calls, together with his pranks and antics, have caused some writers to call him the clown among the common birds.

Half of this bird's food for the entire year is ants and has been so for so long a time that the flicker's tongue has become specialized to obtain these insects easily. For its economic value, see note on woodpeckers on page 423; and for a complete description of the flicker, see *Educational Leaflet No. 5, National Audubon Societies.* To study the flicker, use the same general method as with other birds and the same questions.

12. The Crow.—(*a*) ILLUSTRATIONS. Secure a tame crow, a mounted specimen, or a good picture. The first is greatly to be preferred and, in the country or small towns, can often be borrowed for a few days.

(*b*) WHERE FOUND. The crow lives throughout North America from Hudson Bay to the Gulf of Mexico.

(*c*) DESCRIPTION. The entire length is from sixteen to seventeen inches and the tail is seven and one-half inches. The bill is two inches long. The wings appear saw-toothed when spread, and are almost equal to the tail in length. The feet are strong and adapted to walking. The color is a rich, glossy black. The cry is very harsh and loud. In disposition the bird is bold, fearless, thievish, generally mischievous and full of curiosity. It pulls up young corn, robs nests of small birds, steals eggs from wild and domestic fowls, flies in a straight line ("as straight as a crow flies") at an average rate of twenty-five miles per hour, gathers in large flocks and is a great eater. Crows may be tamed and, occasionally, they learn to talk a little.

(*d*) FOOD. This consists of fruits, seeds, corn, oats, berries, acorns, all vegetables, snakes, frogs, worms, insects and meadow mice. The crow pays the farmer for corn by eating insects, cut-worms and grubs. On the whole, it does much more good than harm.

(*e*) NEST. The nest is large, coarsely built of twigs, sticks, moss, grass and leaves. It is about twenty inches in diameter and ten inches deep. Both male and female assist in building, and complete the nest in less than a week—sometimes in three days.

(*f*) EGGS. These are from four to six in number, of bluish-green color, tinted with brown, and are quite large for the size of the bird. Usually but one brood is hatched in a summer and that early in the season.

(*g*) SEAT WORK. Draw, paint or sew a crow in outline.

(*h*) LANGUAGE, LITERATURE AND SONGS. Fables, anecdotes, proverbs, poems and songs concerning crows are plentiful and should be used freely, as they are full of interest and show the wisdom and shrewdness of this peculiar bird.—Adapted from Miss George's *Plan Book*.

As the study progresses with older pupils, birds may be classified as land birds and water birds, as song birds and game birds, as insectivorous or otherwise, as birds of prey and the opposite—with many other general classifications called out by a minute study of parts and habits.

13. The Duck.—The tame duck or the goose would be the natural introduction to aquatic birds. Of these two, the duck would be preferable to begin with, it being smaller, more easily handled and more easily obtained.

(*a*) POINTS TO CONSIDER. From personal observation, have primary pupils learn that the body is boat-shaped, the bill thick and strong, with a natural sieve to strain out the water and leave food in its mouth. Also, from observation, learn answers to the following questions:

(*b*) QUESTIONS. Where are the nostrils? Where are the ears? Are they large or small? Where are the legs placed on the body? Are they like those of a hen or different? Why? How many toes are there? How many are webbed? How does the web help? What is the color of the plumage? Why are the feathers so oily? Why can a duck swim, while the hen or the robin can not? What are the best conditions for the tame duck? Why are tame ducks valuable? (Eggs, feathers, food.) What is their food? Why are duck's eggs often given to a hen to hatch? How long must they be brooded before they hatch? What are baby ducks called? What kind of a nest does the duck make? Where do ducks prefer to nest? What is their food? What food do they get from the water? How do they get food when on a pond?

If possible, compare a tame duck with wild ones as to size, plumage and habits. In the right season, one may get teal and canvas-back ducks from a good market; otherwise use stuffed specimens or pictures as aids. Have the pupils draw an outline of the duck and of the duck's foot.

(*c*) LITERATURE. *Who Likes the Rain?* (Poem). Story of the hen that hatched ducks. (The best one is *Little Mother Quackalina.*) *The Ugly Duckling.* Bryant's *To a Waterfowl.*

14. Suggestive Studies.—Alice Hall Walter has made an outline for bird study (for the Illinois Audubon Society) in schools, that covers the greater part of the birds common to the state. This outline may be obtained by addressing the Illinois Audubon Society, Wheaton, Ill. Price, one cent each, or 65 cents per hundred.

With this as a guide, any teacher can make an outline that will exactly suit her own locality. Some changes will be required, particularly in simplifying the work, where there are primary grades only. The outline is arranged to cover both indoor and outdoor work during the entire year.

Some of the chief points for each season are: (1) identification of many birds of the neighborhood common to that season, as the English sparrow, robin, flicker, bluejay, barn-swallow, meadow lark, etc.; (2) establishing a general standard of comparative size, remembering that the robin is from ten to eleven inches long and the English sparrow about six inches; (3) learning where these birds are most often seen, as in the air, in the water, on the ground, on trees or among bushes; (4) determining how the wind, rain and snow affect birds; (5) learning the difference in size and plumage between male and female birds; (6) learning how and where birds sleep; (7) finding out what birds are permanent residents and what are spring and autumn migrants, winter visitors or summer visitors. These and many other questions corresponding to those previously given in this chapter should be used as points for special study.

15. How to Help the Birds.—If you are a lover of birds and would like their beauty and music near your homes, and their unceasing diligence to protect your plants, you can speedily attract them to your own yards by (1) keeping, in retired places, shallow pans filled with water for them to drink and bathe in; (2) hanging out pieces of suet or salt pork for them when the weather is cold; (3) by scattering crumbs on stormy days ("a bird restaurant"); (4) by planting elder bushes, wild cherries, mulberries and other shrubs and trees around your lanes or back fences; (5) by building homes for them if shrubs and trees are lacking; (6) by protecting them against their enemies.

For excellent suggestions and models for bird houses, consult *Nature Study and Life*, by Hodge, chapter twenty. Mr. Hodge also tells how to make a bird census and a food chart. *Bird Lore*, the organ of the Audubon Societies, contains a wealth of material.

Public interest may be awakened and made permanent by (1) combining Arbor Day and Bird Day (as in Wisconsin and Illinois), celebrating the day designated by the governor with exercises appropriate to both subjects; (2) by teaching the state game laws and the economic values of birds; (3) by keeping school scrapbooks of pictures and interesting and varied literature upon birds; (4) by keeping migration records and exchanging with other schools of the state, or by posting important bird facts upon a public bulletin board (in postoffice, if permitted); (5) by making known the shameful facts in regard to bird slaughter for millinery uses, for "practice shooting" or "just for fun."

Use all proper means to emphasize the intelligence, patience, courage and devotion of the birds. There are thousands of excellent fables, anecdotes, legends, poems and stories to supplement the facts gained by personal observation.

Disabuse the children's minds of the idea that a bird's life is all freedom and happiness. Teach its cares, its enemies, its faithfulness to duty, its trials, its ingenuity in overcoming obstacles and its patient courage in times of disaster. As an illustration of these qualities among recent bird stories, one of the best is by Mr. C. H. Sylvester, *A Woodland Episode*, published in the *Wisconsin Arbor and Bird Day Manual for 1904*.

An extract from *The Thrush's Lesson* will help children remember birds that walk and birds that hop:

"The birds that scratch in the earth, little boy,
And the birds that wade in the water with joy,
Can *walk*, one foot at a time, you see,
As you do, except when they *hop* like me.

"But most of the birds that can sing you a song
Are small, and their legs are not very strong;
Walking, wading and scratching they leave to the rest;
But hop, hop, hop and fly with the best.

"I've many relations, each one of us sings;
We're called warblers and perchers, and other true things.
Just keep your eyes open, while out at your play,
You'll see what I've told you is true. Good day!"

16. Nests and Nesting Time.—During the early spring months, the pupils, large and small, should be interested in watching for signs of nest-building. They should note the date when the nest is begun and how long it takes to complete it; the time of day when work goes on; whether the male, female or both birds work; the place chosen; the neatness of work; the materials used for outside and for inside; the size of nest; how it is fastened in place; the number, size and color of eggs; and they should make comparison of the housemaking of different birds observed.

When these observations are being made, every precaution should be taken to prevent the birds from being frightened and the nests from being robbed or destroyed. Emphasize the hard work, patience, skill and intelligence shown in the nest-making, and arouse that sympathy for the little home-makers which leads to their protection.

In the autumn, after the leaves have fallen, the nests will show plainly among the naked twigs of the trees, shrubs, vines and hedges. The dried and shrunken weeds and grasses will also disclose the deserted homes of such birds as nest on or near the ground. The nests, having been deserted, may now be collected and studied in detail for those facts relating to materials, construction and the like, that could not be accurately settled by the more or less distant study in the spring.

A large branch of a tree may be brought to the schoolroom, the nests placed naturally therein and the whole kept as a permanent part of the school museum. The old nests will greatly help the younger pupils in their observation the following spring, by showing definite points in materials and methods of construction.

By watching carefully, pupils will learn that robins build near the homes of people, in trees, hedges, vines, shrubs, over the porches, and that, like people, some of them are very careful and others very careless housekeepers.

Bluebirds prefer to nest in holes in old apple trees, stumps, or in bird houses. The song sparrow builds on the ground, in hedges or among bushes. The meadow lark and some blackbirds build on the ground, often in rather marshy places. Swallows build under the eaves of barns, in chimneys or in banks of sand or soft clay.

Woodpeckers like to make their nests in trees that bear nuts. The orioles choose elms, oaks, cottonwoods or other high trees. Yellowbirds and catbirds build in thickets of bushes. Phoebes build under bridges, in fence-corners, bushes, and sometimes in curious, unexpected places, as do the martins when unable to find a bird house already prepared for them. Wrens also build in odd places.

Crows and eagles build in the tops of high trees, and the eagle sometimes in the crevices of a high cliff. Cowbirds and the English cuckoo build no nests at all, but lay their eggs in the nests of smaller birds, who are compelled to rear the young of the marauders. Pigeons, magpies, whip-poor-wills and some others are careless builders or lay and hatch their eggs on sand or rocks.

17. The Migration of Birds.—The subject of migration is but partially studied in the spring when noting the times when the different birds arrive in any certain section. The fall study will, in some respects, be more satisfactory and opportunities for observation more frequent, since most of the birds assemble in flocks before they depart for the South. But then the plumage of the immature birds and the fading colors of the adult males make them difficult of identification.

(*a*) POINTS TO SETTLE. Certain questions should be kept before the pupils; as, Why and when do birds migrate? What preparations do they make for the journey? Do they change their coats? Do they go in pairs, flocks or alone? By day or night? Quietly or noisily? Do they fly high or low? With a rapid or sweeping motion of wings? Why do the birds stop on their journeys?

(*b*) FACTS TO LEARN. Timid birds and those that live in the woods fly at night, especially those that usually catch their food at night; as owls, nighthawks, whip-poor-wills.

Swallows, bluebirds, robins, larks, crows and others fly by day. Birds that feed almost exclusively on small insects, such as the swallows and warblers, are the first to leave, and the birds that remain in the North through the winter are such as can subsist on winter berries, weed seeds and so on. These often need aid during severe storms.

18. When the Birds Go South.—

October.

First Week:	Bobolink.
	Phoebe.
	White-eyed Vireo
Second Week:	Catbird.
	Cowbird.
	House Wren.
	Nighthawk.
	Purple Grackle.
	Redstarts.
	Rusty Blackbird.
	Scarlet Tanager.
	Swifts.
	Whip-Poor-Will.
Third Week:	Chipping Sparrow.
	Sparrows.
Fourth Week:	Oven Bird.
	Red-eyed Vireo.
	Swamp Sparrow.

Fifth Week: Hermit Thrush.
Wood Thrush; other thrushes earlier.

Last Week: Chewink.
Humming Bird.
Indigo Bird.
Meadow Lark.
Red-winged Blackbird. Flocks extensively in the marshes and disappears the last week.
Rose-breasted Grosbeak.
Song Sparrow. Some go southward and others come from the north this month, but the species is present in most localities all winter.

—Compiled from Ernest Ingersoll's *Nature Calendar*.

Copy this list upon a sheet of manila paper and hang it in plain sight for reference. Have pupils watch the birds and compare the results they get with Mr. Ingersoll's observations. Also have them add to this list familiar birds not named herein, as the robin, bluebird, etc., whose migration they determine from personal observation.

19. Bird Literature.—The widespread and increasing interest in the subject of birds has caused a great many valuable bird books to be published, far more than we have space to enumerate; hence we select those within reach of most teachers, suggesting that books from this list be added to the school library as rapidly as circumstances permit. These exclude bird poems, anecdotes and other bird literature of a general character that are also greatly needed.

20. Helpful Literature on Birds.—

Dugmore, A. R., *Bird Homes*, Doubleday, Page & Co., New York	$1.50
Flagg, Wilson, *A Year with the Birds*, Educational Publishing Company, Chicago	1.00
George, Marion, *The Plan Books*. A. Flanagan Company, Chicago. See page 407, footnote.	
Hodge. C. F., *Nature Study and Life*, Ginn & Co., Chicago	1.50
Lange, D., *How to Know One Hundred Wild Birds of Illinois*, Educational Publishing Company, Chicago	.50

Lange, D., *How to Know One Hundred Wild Birds of Indiana*, Educational Publishing Company, Chicago	$0.50
Lange, D., *How to Know One Hundred Wild Birds of Missouri*, Educational Publishing Company, Chicago	.50
Miller, Mary, *My Saturday with a Bird Class*, D. C. Heath & Co., Chicago	.25
Miller, Olive Thorne, *The First Book of Birds*, Houghton, Mifflin & Co., Chicago	.60
Miller, Olive Thorne, *The Second Book of Birds*, Houghton, Mifflin & Co., Chicago	1.00
Parkhurst, H. E., *How to Name the Birds*, Charles Scribner's Sons, Chicago	1.50
Stickney, J. H., *The Bird World*, Ginn & Co., Chicago	.60
Wright, Mabel Osgood, *The Citizen Bird*, Macmillan Company, Chicago	1.50

21. Bird Magazines and Pamphlets.—*Birds and Nature; The Auk; Bird Lore; The Wayside; National Audubon Educational Leaflets; Cornell Nature Study Leaflets;* Bulletins from United States Department of Agriculture; Wisconsin, Illinois and New York Arbor Day and Bird Manuals; colored pictures of birds, A. W. Mumford, Chicago, two cents each for twelve or more.

22. For Other Phases of Study.—

Arnold, Sarah L., *Waymarks for Teachers*, Silver, Burdett & Co., Chicago	$1.25
Engell, Annie G., *Outlines in Nature Study and History*, Silver, Burdett & Co., Chicago	.48

Cautions. 1. Bear in mind that the work outlined is far more than can be accomplished by the first three grades; it covers all that needs to be done by the oldest pupils of rural schools.

2. The time for science study must be divided so as to give attention to weather changes and conditions, to the use of the thermometer and barometer, weather flags and reports, to preparations for winter and for spring, and to plants, birds, insects, rodents and domestic animals. These

are of the greatest practical value, and each should be studied in the season best suited to it.

3. Do not attempt too much at a time. Bend the energies to awaken an abiding interest in all forms of nature and trust to that interest as the basis of continued study and progress.

II. INSECTS

23. Important Facts.—The distinctive parts of an insect's body are three, viz., head, thorax and abdomen.

Other facts necessary to teach at the beginning of insect study are: (1) A caterpillar is a larva and not a true worm. It is an insect in one stage of its development. (2) Every larva grows from an egg, but larvae do not produce eggs. (3) A larva left to itself and unmolested in its transformation, changes to pupa or to a form known as chrysalis. (4) Many larvae spin cocoons of silky fabrics or of felty texture for a protective covering for the chrysalis. The terms *cocoon* and *chrysalis* must not be confused. Explain to the children that the cocoon is but the blanket that covers the real baby (the chrysalis). (5) The chrysalis while sleeping is undergoing important internal changes, and from it, after a proper time, will emerge either a perfect moth or a butterfly.

This adult insect will soar away to begin a new cycle of insect growth by laying eggs, which will change into larvae, then chrysalides, then moths or butterflies. The larvae of moths and butterflies are called caterpillars.

Every complete transformation, therefore, consists of four stages, viz.: (1) Egg. (2) Larva or caterpillar. (3) Pupa or chrysalis. (4) Adult insect or imago.—Abridged from *Insect Biographies* in the *Popular Educator*.

24. How to Tell the Butterflies from the Moths.—(*a*) BUTTERFLIES. The antennae, or horns, are always smooth and thread-like, with knobs at the tips. The wings are closed when at rest and held vertically upright as a protection. This conceals the brightest colors on the wings and prevents notice. The butterfly flies by day, fluttering from flower to flower, and sleeps at night, clinging to grasses, flowers or trees. It does not come out of a cocoon.

(*b*) MOTHS. The bodies are generally larger in proportion to their wings than are those of the butterflies. The antennae are feathered or spined and have no knobs at the tips. The wings, when at rest, lie down flat. Moths generally fly at twilight and through the night.

25. Butterfly Caterpillars and Moth Caterpillars.—Caterpillars with spines usually produce butterflies and those having a hairy growth, more or less thick, are apt to produce moths. In case of naked caterpillars, one can not determine beforehand, but must watch results.

26. Caterpillar Food.—"Each caterpillar requires to be fed with whatever kind of leaf you find him upon. If upon the grape vine, give him grape leaves to eat, and so on. . . . If you can not find out what he is and what he should have, and fail to suit him with any variety of leaf you have at command, you must either let him go or see him die."—From Ballard's *Moths and Butterflies.*

27. Formation of the Chrysalis.—"On a pleasant, sunshiny day in September, I noticed a caterpillar crawling along under the lower edge of the siding of our home and determined to watch this one. I remained there the greater part of the day. The caterpillar seemed undecided in its movements, and did not move far from the same place.

"At last my patience was rewarded—the caterpillar suddenly dropped its head downward, but still held to the siding with its tail. In a moment more it began a sort of wriggling movement, really reminding me of a child wriggling out of its shirt when going to bed, and soon the caterpillar's furry garment came over its head and dropped to the ground.

"It looked a bright flesh color under its fur. Its next movement was to curl up a little, and even as I watched a sort of slime seemed to cover the body of the caterpillar—it must have been a secretion from its own body—and hardened into a gray shell, closely fitting its body. Then the caterpillar was ready for the winter.

"The larva of the moth makes both its chrysalis and its cocoon. It first selects a good place to weave its little house—usually in the branches of some tree. After this outer house or cocoon is finished, it goes through the same performance as the larva of the butterfly."—Martha Koehler in *School Education*.

28. Outline for Butterfly Lesson.—(*a*) MATERIAL. Bring a butterfly before the class in a glass jar or box made of close wire netting, with some fresh flowers and twigs. Leave room enough for it to fly about.

(*b*) METHOD. (1) *Body*. How many main parts?

(2) *Wings*. How many? How and where are they attached to the body? How covered? How moved? What is their position when at rest?

(3) *Legs*. How many? How attached? Of what use are they to the insect?

(4) *Tongue*. Why is it so long? What is its position when not in use? When and how does it get its food? What is its manner of eating?

(5) *Eggs*. When and where are they found? To what are they fastened? How are they fastened? How are they arranged? What is their color? Size? How long before they hatch?

(6) *Habits*. Are the butterflies solitary or in families? When and how do they sleep? What is their manner of flight? Mode of protection?

(7) *Use.* What are the uses of the butterfly to flowers? (Carry pollen and help fertilization.) How are butterflies harmful to plant life? Butterflies are used as a symbol of what? Why?

(8) *Literature.* Anecdotes, myths and poems. Songs.

29. Questions on the Mourning Cloak.—"At what date did you see the first mourning cloak this season? Why did it not die of freezing during the winter? Is the first mourning cloak that you see in the spring bright in colors and perfect in form, or is it somewhat battered and faded? From your observation on the above question, you can infer whether it is fresh from the chrysalis or whether it wintered as a butterfly. Which do you think? Describe the flight of this butterfly. Does it flutter, or does it sail, or does it do both? Do all butterflies pass the winter in the same stage of life as does the mourning cloak? Describe the colors and the markings of the mourning cloak's wings above and below. How many legs has the mourning cloak? Capture a butterfly without harming it and put it in a cage made of mosquito netting and give it sweetened water in a vial with a small neck. Describe how it gets the water."—Mary Rogers Miller in *Home Study Nature Course.*

30. A Box for Cocoons.—"A glass box for cocoons and caterpillars is more artistic and convenient than a variety of bottles and jars, and such a box can be made in twenty minutes.

"The materials required are three sheets of window-glass, 8 x 10 inches, for the sides and top of the box, a piece of wire screening for the ends, a sheet of heavy cardboard the same size as glass for the base, and some white passepartout binding. With the passepartout join a long side of the cardboard to the same length of a sheet of glass, then join the opposite side of the cardboard to another sheet of glass. Now you have the base and two uprights.

"Fasten the third sheet of glass to the other two for the top and the box is completed, excepting the ends, for which the wire screening is bent the required size and can be easily fastened over the glass at the top and sides and under the cardboard. The screen can be removed when attending to the contents of the box.

"Cover the floor of this box with moss, if you like, selecting that which has little growing leaves and vines, fasten in a few quaint-looking toadstools, or, if too late in the fall to secure anything green, put in twigs, and you have an attractive little house, when your cocoons and caterpillars are enclosed, which will be watched with great delight by the children.

"Unless the cocoons are already fastened to twigs, even if you use moss, do not forget a branch or two for the forthcoming butterflies or moths to hang from in order to protect their wings.

"But of course you will wish to see some of the coverings spun. A shallow box filled with earth and a few fresh leaves, such as the caterpillar is found feeding upon, should be added for new occupants."—Nellie E. Daily in *Primary Education.*

31. **Butterfly Seasons.**—"As roses belong to June, and chrysanthemums to October, so butterflies seem to be a joyous part of July. It is their gala-day, and they are everywhere, darting and circling and sailing, dropping to investigate flowers and over-ripe fruit, and rising on buoyant wings high into the upper air, bright, joyous, airy, ephemeral. But July can only claim the larger part of their allegiance, for they are wanderers into all the other months, and even occasionally brave the winter with torn and faded wings.

"It may appear strange, if not altogether inappropriate to the season, that 'the fair, fragile things which are the resurrection of the ugly, creeping caterpillars' should be almost as numerous in October as in the balmy month of July. Yet it is true, and early October, in some parts of the country, is said to be perhaps the best time of the year for the investigating student and observer of butterflies. While not quite so numerous, perhaps, many of the species are in most perfect condition, and the variety is still intact. Many of them come and remain until frost, and the largest butterfly we have, the Archippus, does not appear until the middle of July, but after that is constantly with us, floating and circling on the wing, until October.

"Many varieties of the Vanessa are often seen flying about in May, but they are far more numerous and perfect in July, August and September. A beautiful azure-blue butterfly, when it is fluttering over flowers in the sunshine, looks like a tiny speck of bright blue satin. Several other small butterflies which appear at the same time are readily distinguished by the peculiar manner in which their hind wings are tailed. Their color is a dull brown of various shades, marked in some of the varieties with specks of white or blue.

"All June and July butterflies are August and September butterflies, not so numerous in some instances, perhaps, but still plentiful, and vying with the rich hues of the changing autumnal foliage."

32. Insect Preparation for Winter.—"(*a*) BROWN WASP. Queens seek shelter in houses, logs, stumps and other sheltered places for the period of hibernation; other forms die.

"(*b*) HORNET AND YELLOW-JACKET. Queens find shelter in old nests, or in other convenient situations; drones and workers die.

"(*c*) BUMBLE-BEE. Drones and workers die; queens seek shelter in the nest or in similar places on the ground.

"(*d*) ANT. Species living in earthen nests retire to lower parts of the nest; others inactive.

"(*e*) Mud Wasp and Digger Wasp. The few remaining adults die, leaving only immature forms in the cells to live through the winter.

"(*f*) Ichneumon Fly. A few adults go into hibernating quarters; many species winter over in the immature condition.

"(*g*) Ground Beetle. Seeks shelter under logs.

"(*h*) Ladybird Beetle. Adults seek shelter in leaves about the bases of trees and in similar situations; many hundreds or even thousands of the same species will often congregate in such a place.

"(*i*) Black Blister Beetle. Adults die, leaving larvae in the soil to live through the winter.

"(*j*) May Beetle. Some larvae change to pupae and then to adults remaining in pupal cells; other larvae burrow deeper into the soil.

"(*k*) Long-horned Beetle. Larvae commonly burrow deeper into the wood.

"(*l*) House Fly. Adults seek hibernating quarters in houses, sheds, under bark, etc.

"(*m*) Fall Canker-worm. Moths appear and lay eggs on twigs of apple and elm trees.

"(*n*) Bud-worm. Larvae fasten their silken cases to the bark of twigs near the buds."—From Ingersoll's *Nature Calendar*.

33. Ants.—Ants form a very interesting and instructive study for children. They can be studied in the schoolroom by providing an ant house in which to keep them. This can be made by having a tinner take a piece of tin about eight inches square and join it to a curved piece, forming around the center a little ditch. Fill this with water so that the ants can not make their escape, and on each of the four edges of the square stand a thin piece of glass about an inch high so as to form a room with glass sides. A piece of glass can also be used for the top. Take up a small ant hill, taking care to preserve it intact as far as possible, and place this in the ant house. If provided with air and food, the ants will live here nearly as well as out of doors, and all of their habits and methods of work can be studied.

The children will soon discover that there are three classes of ants—the males, females and workers; also that the males and females never work. They will also be able to see the life-history of these insects by watching the eggs to see when they hatch, and noticing the care which some of the workers, popularly called nurses, take of the young. A simple microscope is of great assistance in this study.

Before proceeding to the study of the ant, the teacher should become thoroughly informed on the habits and life-history of the insect and be able to give clear descriptions of these; also to tell stories concerning the ants that live in different parts of the world.

Cautions. 1. See that the children recognize the intelligence, courage, strength, patient industry and wonderful ingenuity of the ant.

2, Teach that their extreme love for sweets and fats renders them most unwelcome to the housewife; and that their protection of aphides (plant lice) makes them noxious to the farmer.

3. The chief enemies of ants (and hence, friends of the agriculturist) are the woodpeckers and nighthawks, both of which consume enormous numbers of these insects.

4. The literature pertaining to ants is most interesting and should be freely used.

34. Crickets.—Prepare two or three small, light boxes and fit them with a glass cover or sides. The boxes should be perforated so as to admit of free circulation of air. These make convenient cages for the study of most insects. In the autumn, place some crickets in the cages and lead the children to study them freely. For class work the boxes can be passed from desk to desk, and the pupils can describe or draw what they observe. At the conclusion of the study the boxes should be taken out of the building and the crickets set free.

In addition to the above, the pupils should be led to study crickets while out of school, thus learning facts about their homes and habits and dispositions.

Concerning crickets, as well as ants, there are many interesting proverbs, anecdotes and songs that should be interwoven with the study of the insect.

Caution. In all studies of insects, in addition to the description of bodies, dispositions, homes and habits, there should be very careful attention given to the food of each kind, thus determining whether the insect be harmful or otherwise. In case it is harmful, then its enemies should be learned and protected. Other modes of extermination should be studied.

35. Bibliography for Insect Study.—

Ballard, Julia P., *Among the Moths and Butterflies*, G. P. Putnam's Sons, New York $1.50
Burkett, Stevens and Hill, *Agriculture for Beginners*, Ginn & Co., Chicago .... .75
Burroughs, John, *Birds, Bees and Bright Eyes*, Houghton, Mifflin & Co., Chicago .... .60
Comstock, Anna Botsford, *Ways of the Six-footed*, Ginn & Co., Chicago .... .40
Morley, Margaret W., *Insect Folk*, Ginn & Co., Chicago ...... .45
Morley, Margaret W., *Little Wanderers*, Ginn & Co., Chicago .. .30
Weed, Clarence M., *Stories of Insect Life*, First and Second Series, Ginn & Co., Chicago .... $0.25 and .30
Wright, J. M., *Seaside and Wayside Series of Readers*, D. C. Heath & Co., Chicago .... $0.35 and .50

III. ANIMALS

36. Familiar Animals.—During the winter months the study of birds and insects may be omitted in the primary grades and the study of quadrupeds taken instead.

It is always better to begin with familiar animals, borrowing pet dogs, cats, rabbits and others, for the purpose. By kind treatment and proper feeding, these animals will soon feel at home in the schoolroom and permit themselves to be thoroughly inspected and freely handled.

If there is a child hard to interest in school matters, borrow that child's pet and have it fully understood that the loan is to be looked upon as a very special privilege, only allowed to those whose conduct and lessons are up to the required standard.

37. Animals Preparing for Winter.—The squirrels secure nuts for winter use; the fur-bearers grow thick, heavy coats, glossy and bright; cattle and horses and other domestic animals grow longer hair and heavier pelts, and the hibernating animals get ready for their long sleep.

38. The Rabbit.—(*a*) ILLUSTRATION. Have a pet rabbit brought to school.

(*b*) METHOD. Have for your own use the following topics, which may be developed as suggested:

(1) *His Coloring a Protection.* Perhaps he is a little brownish-gray rabbit. Have the children notice his color. Then ask how many have seen white rabbits with pretty, pink eyes. Ask where wild rabbits live. (Wild rabbits make their homes in the fields or woods near patches of clover. The nest is a shallow hole burrowed out under a stump or clump of weeds and lined with grass.) Which do you think you could see the more easily in the fields, the brown or the white rabbit? Why? (The brown rabbit's coloring harmonizes with its surroundings, the ground and vegetation. Its coloring is protective. White rabbits may be said to be a freak of nature. They are very few in number. They fall a prey to their enemies more easily than the colored ones, for they are very conspicuous in color, are not hardy and their sight is poor, because they have no coloring matter in their eyes.)

(2) *Nose.* After watching the rabbit for a few minutes some of the children will ask, probably, "What makes it move its nose in that funny way?" Perhaps some of them have seen a dog snuff the wind and can tell why he does it. (The rabbit can find out in this way if his enemies are near and then can run away, as he has no other means of defense.)

(3) *Hind and Fore Legs.* Call attention to the difference between the hind and fore legs. Ask if any of them have seen the rabbit run. (He leaps rather than runs and his hind legs are therefore long and powerful.) You then might ask, "Can he go faster up hill or down?" (Perhaps some have seen him run up hill, his long leaps taking him away from the dogs at a great rate. When he comes to the descent on the other side and has to go down hill, however, poor Bun has been known to go heels over head down the slope, and if the hill is very long, to be overtaken by the dog.

(4) *Tail.* The children will be much amused, doubtless, by his little short tail, looking like a bunch of cotton and giving him his nickname of cotton-tail. This little tail, showing white, is thrown up when the rabbit runs and may be used as a signal to tell the little ones that danger is near.

(5) *Divided Lip.* Some boy or girl will notice the split lip, and you can feed the rabbit clover and let all see how it eats and that having this divided lip enables it to get its food into its mouth easily.

(6) *Food.* The children will tell you that, besides clover, the rabbit eats lettuce, cabbage and apple, and it would be a pleasant diversion for "little brother" and the children to let him eat a mouthful of each to show this to be so. Too much luxury, it is said, is no better for Bunny than for people, and it is known that rabbits that live on a hillside where clover grows abundantly are not as healthy as those that must cover a much wider range in hunting for a livelihood. Exercise is needed by all animals.

(7) *Ears.* The beautiful silky ears of the rabbit are not for ornament merely, but serve to catch the sound and render his hearing keener, for the rabbit depends on his speed to escape from his enemies and nature gives him keen scent and hearing to enable him to detect their approach.—Adapted from lesson by Isabel Bond in *Primary Education.*

(8) *Literature.* There are many excellent fables and anecdotes about the rabbit. Be sure to read the story of the *Tar Baby.*

In giving a lesson upon the rabbit, teachers may use the picture *At the Farm* in case a live rabbit cannot be obtained.

Caution. In addition to the information given in the above lesson, children should be taught that rabbits are very easily hurt or killed, hence they must be very carefully handled; also, that they are very prolific breeders and when numerous are apt to do serious injury to the young trees, especially fruit trees, by burrowing around the roots and gnawing the tender bark; they also often do much damage to gardens.

39. The Goat.—(*a*) FAMILIAR NAMES. (1) *Male.* "Billy goat."

(2) *Female.* "Nanny goat."

(3) *Young Goat.* Kid.

(*b*) DISTINGUISHING CHARACTERISTICS OF BILLY GOAT. He has large, strong horns, which he uses for defense and with which he often butts children or adults when cross or mischievous. He can be trained to wear a harness and draw a cart or small sleigh. He has a beard on the chin.

(*c*) DISTINGUISHING CHARACTERISTICS OF NANNY GOAT. She has smaller horns, no beard, and a very gentle and playful disposition. She gives milk of very rich quality. Herds of goats are kept for milk in mountainous districts where cows could not climb to the rocky pastures, and in many foreign countries they are the chief source of milk supply.

(*d*) OUTLINE FOR STUDY. (1) *Body.* Size; shape.

(2) *Covering.* Kind; color; use.

(3) *Legs.* Number; feet; hoofs, number and kind.

(4) *Head.* Eyes; ears; mouth; teeth, number and kind.

(5) *Horns.* Number; position; size; shape; use.

(6) *Food.* Hay; oats; grass; clover; vegetables; leaves; thistles and other weeds; water, occasionally.

(7) *Products.* Milk; butter; cheese; flesh for food; skin for leather; hair for plaster and for coarse cloth; bones for fertilizer.

(*e*) LITERATURE. There are many interesting fables and anecdotes that may be used with profit.

40. The Cow.[1]—Keep the following study outline before the class for several days, requiring the facts to be obtained from the observation of living cows, when possible; otherwise, do as well as may be by the use of pictures, stories, blackboard drawings, etc.

(*a*) STUDY OUTLINE. (1) *Body.* Size; shape; covering; use of covering; color.

(2) *Head.* Face; eyes; ears; nose; mouth; lips; tongue; teeth, number and kind; horns, number, shape, position and use.

(3) *Limbs.* Number, shape, size; feet; toes; hoofs.

(4) *Tail.* Length; quality of hair; use.

(5) *Stomachs.* Give only a general description. Tell what is necessary, since this part can not be illustrated.

(6) *Food.* Grass; hay; grains; vegetables; water; milk.

(7) *Udder.* Shape; size; position; use.

(8) *Products.* Milk; cream; butter; cheese; flesh for beef; skin for leather; hair for plaster; horns for combs, buttons, etc.; hoofs for glue; bones for fertilizer.

(9) *Care Needed.* Kindness; gentle voice; plenty of food and clean water;. clean, warm, well-ventilated and well-

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[1] By M. Helen Beckwith (adapted).

lighted stables; regularity in feeding, watering and milking; good pasturage for as many months as the weather will permit. The best pastures are those that have running water and at least a few trees for shade.

(*b*) ADDITIONAL QUESTIONS. How does a cow lie down? How get up? How defend herself? How eat and drink? What sounds does she make? Does she get angry? On which side should the milker sit? Is the cow handsome? Graceful? Can she run fast? What is her baby called? Is she a kind mother?

41. Protection of Wild Animals.—Valuable lessons can be given the older pupils on the relations of the larger wild animals to man, and the destruction of those animals caused by sportsmen and by professional hunters. The sportsmen destroy these animals for the mere sport of killing game, and the hunter destroys them for their products, such as fur and flesh. For these reasons many of the large animals as well as many species of fish have for a number of years been in danger of extermination, and to prevent this both state and national governments have enacted game and fish laws which either prevent the killing of game at all or restrict it to certain seasons of the year. In addition to this, the United States government has established game preserves in the Yellowstone and Yosemite National Parks, besides several smaller preserves in Arizona, Colorado, Montana, Nebraska and New Mexico.

Call attention to what is being done to protect valuable animals from ruthless destruction, and lead the pupils to become acquainted with the fish and game laws of their own state; and what is more important still, develop in your pupils a sentiment against killing animals for mere sport. This is a very practical and important phase of nature study that no teacher should overlook.

42. Final Word.—From lack of space, further lessons must be omitted. However, from those given, outlines can easily be prepared for the study of other animals.

Great care should be taken to have the children understand the provision nature has made for each animal to live its life to the best advantage, that is, the wise adaptation of its structure and habits to suit its environment.

Another point that should always be emphasized is the relation of man to the animal world, and the interdependence of men and the domestic animals.

Interest, exactness of observation, practical knowledge, the growth of humane feelings and a spirit of grateful reverence should be the outcome of all lessons in nature study, and the progress that children make along these lines should be the divining rod by which teachers may measure their success.

Work earnestly, systematically, definitely, reverently. Use intelligent, interesting methods. Direct the work, but let the pupils do most of it. Wait patiently for results.

43. General Bibliography.—

Colton, B. P., *Zoölogy, Descriptive and Practical*, D. C. Heath & Co.., Chicago $1.50
Cooper, Sarah, *Animal Life in the Sea and on the Land*, American Book Company, Chicago 1.25
Orton, James, *Comparative Zoölogy*, American Book Company, Chicago 1.80
Packard, A. S., *Zoölogy*, Henry Holt & Co., Chicago 1.50

TEST QUESTIONS

1. Which is the easier for first grade pupils, the study of plants or the study of animals? Why?

2. Why should birds be protected? What can you do to secure an interest in their protection on the part of your pupils?

3. What instructions do children need to enable them to

observe birds carefully? What sort of preparation should the teacher have to enable her to give these instructions?

4. What lessons in character building can be learned from the study of birds? Should such lessons be made prominent? Why?

5. Do you have an aversion for caterpillars and worms? If so, what is the cause of it? How can you overcome this obstacle to your nature study work?

6. What relation should the study of insects bear to the study of plants? What practical lessons that will show their relation can you give?

7. Why is the ant more desirable for study than the fly? Would it be wise to introduce the study of bees into the primary grades? Why?

8. What wild animals are injurious to growing crops? to poultry? Do these animals in any way compensate the farmer for what they destroy?

9. Which would you prefer to have the pupils of primary grades study, the cow or the sheep? Why? What other domestic animals can be studied with profit?

10. What proportion of the term should be given to nature study in the first and second grades? Show how you can relate this work to (*a*) reading, (*b*) language, (*c*) drawing, (*d*) geography.

A DUTCH DAIRY BOY
Photograph from life.

LESSON SEVENTEEN

LANGUAGE

1. The Problem Stated.[1]—When children enter school at five or six years of age, they have learned a large number of spoken words which they use singly or in small groups. However, in the full sense of the word, they have not much oral language, and of written language, none at all.

As to the best means of teaching language to the pupils of the primary grades, hardly two authorities can be found who fully agree.

It must be admitted that the problem is a difficult one to solve, and is made much more so by the unnecessary formality with which a majority of teachers clothe the work. Others fail to get good results because they work without a definite aim and without a clear understanding of what is needed. Their efforts are spasmodic and they reach out in a haphazard way after something of which they have but the vaguest comprehension.

Many of the published works upon language teaching are so made that they point out one avenue of approach, making little or no effort to show other roads just as desirable.

2. The First Step.—The truth that lies at the foundation of all successful language teaching is that language was invented because of the need to express thoughts and emotions and to preserve records for convenient reference.

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[1] Many directions and plans bearing directly upon the teaching of both oral and written language in the primary grades will be found in Lessons Six, Seven and Eight, devoted to teaching reading, and the student is urged to review these lessons in connection with the study of this one.

This being admitted, it follows without question that the first step in the work of language teaching is to arouse thoughts and to inspire emotions such as will stimulate heart and brain and force the child to ask questions or to utter spontaneous exclamations, statements or commands.

When any form of the sentence bursts from the child because he has gained a new thought or emotion and feels the need for expression, the teacher may be sure that interest is at a white heat. The "psychological moment" has arrived in which effective teaching may be done. Unless this point of contact between teacher and pupil is secured, the work is usually mere lip-service, a smatter of terms with the soul left out.

3. **The Child's Equipment.**—Prior to his first school life, the child has gained much intimate knowledge of the home relations and family ties. He knows the household routine and has decided preferences in matters of food, drink and clothing. He has learned games to play and the times of year when they are in favor. He knows something of the farm, the orchard, the workshop or whatever most interests his father and occupies his time.

If his home is in the country, probably he has raced after countless butterflies and has had some unpleasant experiences with bees and wasps. He may have seen snakes and toads cast their skins, and tadpoles develop into frogs. He has learned something of birds and their ways; has exulted in the power of the wind and storm; lazily wondered over the shifting clouds; been thankful for the bright stars and the silver moon that peeped into his darkened room at night. In various ways he has also learned something of authority, obedience and the rights of others. In fact, he has been a living interrogation point, with "What is it?", "Where is it?", "What is it for?" perpetually dropping from the tip of his tongue, and all because his mind was intensely wide-awake.

What has been the foundation for rapid development in the use of language before the child enters the school is natural, spontaneous and far too valuable to be pushed aside by the formal routine that obtains in too many modern schoolrooms. When all is said and done, it is difficult to improve upon nature's plan for the development of her boys and girls, and the closer we teachers can keep to her methods of teaching, the more truly successful our work is sure to be.

4. The Teacher's Part.—The child's mind being thus stored with bits of knowledge, it remains for the teacher to help him recall this knowledge and to add new knowledge that will be properly related to the old. To expand and classify all this knowledge to make it ready for use when needed calls for the definite use of language as a means of expression.

"In every department of teaching begin with the known and proceed to the related unknown." Children will not long stand dumb as statues before a bright-faced, alert, sympathetic teacher even on the first day of school. Timidity will be banished by interest and sympathy, and all but the very shyest children will talk with a reasonable degree of freedom and facility. This, then, is the beginning of the school language work, the informal preparation for more definite teaching of new words and phrases.

At the outset, if the teacher is able to get the children to talk freely, she should be careful not to chill their efforts by many or harsh criticisms. Every new word gained, every new sentence formed, is a distinct step gained in the use of oral language.

Things endowed with life and motion more readily gain the child's interest, hold his attention and call forth spontaneous expressions, because they awaken thought more rapidly and freely.

5. Every Lesson a Language Lesson.—With language, as with penmanship, many of the unsatisfactory results are directly due to the separation of language, as a study, from the other subjects of the school curriculum.

The truth is, every lesson of the day should be to the child a lesson in language. Every sentence used, yes, every word used by the teacher in her entire intercourse with her pupils should be a model which they may safely follow. This is all the more imperative from the fact that children who really love their teacher—as a majority of primary children do—are prone to copy her general mode of speech, her style of pronunciation, even her faults and peculiar mannerisms. Many children, too, come from homes wherein pure, refined English is seldom heard, and to these the teacher's example is all-important. For these reasons, she needs to be always on guard lest in this regard her own heedless habits lead her pupils astray.

6. Language Related to Other Subjects.—Every new fact that the child learns calls for appropriate language in which to express it. Therefore, the teacher, when supplying the right words and sentences to express the new thoughts or emotions and their new relations, is giving a valuable lesson in oral language, as well as adding to the child's store of information in the various lines that the school routine calls for. And when any of these words or sentences are put into script or print for a child to read or copy, a lesson in written language is taught.

7. Undesirable Lessons and Their Correctives.—Lessons in oral language are daily given to the child, most informally, upon the school playground, at home and when he is in the street. Indeed, the unconscious tuition of the street is one of the most difficult things that conscientious teachers of English have to overcome, because it is so varied and dramatic. The excited pantomime, the posters in flaming colors, the novel slang, obscenity and profanity, all these sink deep into the impressionable minds of primary children.

The natural corrective for all this is to make school more attractive than the street, and to build up such a taste for better things as will overcome the corruption of bad examples. One very effective method of procedure is to read and tell many attractive stories to the children. Select stories that are full of dramatic power and of a character to awaken all desirable emotions, and see that your narrative is couched in clear, refined English, but direct and forcible enough to remain as a model.

8. **Oral Reproduction.**—It is not enough to read or tell such stories to children. They should be early trained to give them back in the best language they can command.

For the pupil's first attempt, an interesting but decidedly short paragraph should be chosen from a prose reading lesson. It is better to prepare the way for the paragraph by working first with single sentences. Let the child tell the thought or incident that the selection contains, the teacher helping by a timely suggestion or question when he hesitates as to what comes next. This course is far better than to let a pupil fail in his early attempts to do something new, because it prevents discouragement.

At the next trial, something a little longer may be used. One child may be asked to start the telling, and, when well started, another pupil may take up the narrative, then another and another, until the story is complete. This method holds the interest of the class, calls more pupils into the exercise, and, when questions are well and rapidly distributed, keeps all the members of the class alert and expectant.

When pupils adhere rigidly to the exact words of the book, try to secure more freedom. On the contrary, when pupils are inclined to use too much freedom, introducing slang or any less desirable forms than those in the original, encourage a closer adherence to the choicer words and phrases of the book.

9. Similes and Metaphors.—To familiarize children of the primary grades with the use of picturesque terms, it is well for the teacher to make free use of easy similes and metaphors in both the formal and informal work of the school, and to call attention to the "picture" words and phrases which occur in the reading lessons. This kind of language training should be commenced early in the first year and carried through all the grades, expanding the work and increasing the difficulties according to the advancement of the pupils.

It is far better to weave desirable figures of speech into the early blackboard reading lessons than to starve the child's imagination by forcing him to read endless bald, unadorned statements like "I see a cat," "I see a dog," "I see a hen." Suppose we try, instead: "See my white cat, Snowball. Snowball has a white fur coat. Has your cat a white fur coat? My Snowball has golden eyes. Has your cat golden eyes? Snowball likes me and I like Snowball." In either case, to adults the repetition is tiresome beyond expression, but children do not feel it in the second series of sentences because the language used is such as appeals to their imagination and fills their minds with pleasant images.

10. Methods Illustrated.—Assuming that many of the primary reading lessons prepared by the teacher will be based upon various phases of nature study and familiar experiences of the child's life, a series of figurative sentences appropriate to such lessons during the first three years is here given. Interweave these and others of like character freely among the plainer sentences and see how much more rapidly the children will learn to express themselves in good English.

When these or similar sentences are introduced or found in reading lessons, let the pupils tell what they think is meant. Often ask, "What picture does that make you see?" "Read the sentence again. Now shut your eyes and tell me what picture comes." The novelty of the exercise lends additional interest and impressiveness to the lesson.

11. Suggestive Exercises.—

This is our baby.
Baby has laughing eyes.
Her cheeks are like roses.
Her hair is like sunshine.
What is her mouth like?
Her mouth is like a sweet little pink rosebud.

Little violet has come.
She has on a purple hood.
Sunshine kisses her modest little face.

Hear the little brook laugh and sing.
See how it dances over the pebbles.

Milkweed seeds travel far from home.
Sometimes they go by bird express.
Sometimes they ride on a friendly breeze.
Dandelion seeds and thistle seeds travel the same way.

The day is dying now.
Look at the sunset sky.
See the banners of red and gold.
Soon it will be night.
Then the stars will blossom in the sky.

Mother Nature's Carpet

It is the spring-time. Mother Nature's white fur rugs are worn out. Her floor is as bare as bare can be. Where will she get a new carpet?

"Let me sweep the floor," said March. "I will use my strong wind-broom."

April said: "I will make a carpet for the floor. It shall be of soft, green grass."

Then May said: "I will scatter dandelions over the green carpet. They are as yellow as gold. I will scatter blue violets over it, too."

What did June, sweet June, say?

"I will bring clovers and buttercups for Mother Nature's carpet. I will bring sweet perfume, too. The breath of my roses is the perfume. Who does not love the breath of June roses?"

And so Mother Nature got her new carpet, and June gave her rose perfume, too.

The long arms of the great elms reach across the roads in the park. Do you think the trees shake hands?

See how the people gather under the elms.

The kindly trees shelter them from the sun.

The gentle winds fan their hot faces.

Before the third year has passed, the children will not find it difficult to understand and explain such expressions as "All winter long the winds rock the leaf cradles," "Beyond the purpling hill-tops I see a star," "Humming-birds are jewels with flashing wings," "October is the month of painted leaves," and "March is spring's own trumpeter."

12. Other Phases of Oral Reproduction.—After the class has become used to short reproductions, it is well to have one child reproduce an entire short selection.

The next step would be to take some of the familiar Mother Goose rhymes for the reading lessons and then let each one be told in prose language by the pupils, following the plans previously stated. Some of the best for first use are *Lady Bug; Daffydowndilly; Jack and Jill; Mary, Mary, Quite Contrary; Little Bo-Peep*, and *Little Boy Blue.*

It is but an easy step even for primary pupils, to advance from nursery rhymes to simple fables and short anecdotes. Before the end of the second year, children will easily reproduce such stories as *The Little Red Hen, Little Red Riding Hood, Chicken Little, Cinderella, The Three Bears* and *Puss in Boots.*

The Three Bears, Chicken Little, The Old Woman and Her Pig and some others will be told easily in the last term of the first year, if the children are from American homes, where they hear and speak the English language only. The amount of repetition in these makes them easy to memorize, and when children deviate from the exact language it often adds a piquant flavor to the original tale.

On the contrary, Celia Thaxter's *Spring*, Tennyson's *Cradle Song*, Helen Hunt Jackson's *September* or *October's Bright Blue Weather* and the like are as beautiful as they are simple, and should never be subjected to the distortions that result when children are asked to give them in their own language. Real poems are too fine to be twisted out of shape by the garbled versions due to turning good poetry into bad prose.

Such fables as *The Fox and the Grapes, The Lion and the Mouse, The Wind and the Sun, The Crow and the Pitcher*, and such myths and legends as *Clytie, The Blue-Eyed Grass, Narcissus, Pandora's Box, Rhoecus, Janus* and others are easy for primary children to reproduce orally.

The above are but suggestive types of the work to be done. The amount must depend upon the time allowed for specific language work, the natural ability of the children and the kind of training they receive outside of school.

The object of such exercises is (1) to secure fluency in the use of familiar language, (2) to teach new words and phrases, (3) to create a taste for purer English than that heard on the street and in the majority of homes, and (4) to teach pupils to think clearly when standing and to speak easily and without embarrassment.

The value of this kind of work is so great that it should be freely given in the first grade and continued through all the grades.

Cautions. 1. When the children have a real poem to read, no matter how simple, then have no original reproductions. A genuine poem is such because it contains a beautiful thought beautifully expressed, and the sentiment will be far better remembered if not separated from the language in which the author has clothed it. In such cases always have some portion—or the whole—recited *verbatim* and copied with absolute fidelity upon blackboard or paper.

2. Teachers are not to conclude that all of one form of oral reproduction is to be given before another is introduced. Make one form familiar, then give another for the sake of variety, changing often from one to another.

13. Technical Forms.—So far, the work has been based upon the assumption that language is the result of a need to express thoughts and emotions. The technical forms have not been discussed—and should not be with primary children—but they must be attended to, nevertheless, and kept constantly in the teacher's mind until the pupils learn from long practice to use them correctly without being obliged to give thought to the matter. It is the teacher's business to eliminate from the language of the school all slang and all ungrammatical expressions, of which *I seen*, *I done*, *aint*, *taint*, *haint*, *he has went*, *he don't*, *them things*, *those sort of things*, *I be* and many others are familiar, everyday types.

To weed out the objectionable language which is found in nearly every school requires unlimited patience, unceasing vigilance, a perfect example and much tact on the part of the teacher. It is, literally, "line upon line and precept upon precept, here a little and there a little," and this, too, all day and every day. Harsh criticisms or ridicule in any form should never be employed.

Usually the child does the best he can or falls into errors of speech through eagerness born of interest in the subject. When a slip of the tongue occurs and the child says, "I seen Frank," it is wiser, quietly to repeat, "I *saw* Frank," or let the account be finished and then say, "Charles, say, 'I sāw Frank. He did it' ", and in this way have all errors corrected. It is a long, hard task, but a kindly persistence will finally have its effect.

The various forms of the verbs *be*, *go*, *do*, *see*, *has* and other common, irregular verbs will cause much trouble, as will the various forms of pronouns. These must be learned from being called constantly into use, no technical explanations being possible at this time. The teacher will need to plan exercises in which troublesome forms may be freely used without having the appearance of being purposely introduced.

Cautions. 1. So far as possible, never let a child of the primary grades hear or see an incorrect form of language. It is the correct form that needs to be impressed; hence the so-called "false syntax" should never be used before the pupils are old enough to study grammar as a technical subject—and even then its use is of doubtful propriety.

2. Be sure that all words used are understood by the pupil. Many teachers, in connection with the reading and spelling lessons, require in the primary—and the higher grades as well—that all new words be used in sentences of the child's own making. Such an exercise frequently leads to absurd mistakes and should not be used in the primary grades.

3. As a rule, teachers are not sufficiently careful when teaching the words of memory gems, songs and poems. One child referred to the first as "memory jams." Another child sang, "Four hundred pussies waiting near," for "For hungry puss is waiting near," and when corrected by his mother refused to change, insisting that his teacher taught the song as he sang it. For the familiar proverb, "Wine is a mocker and strong drink is raging," one said, "God is a mocker and strong drink is ragtime," and declared that was what he had been taught. These are but a few of many illustrations that show the importance of securing on the part of the pupils a clear understanding of both the words and the meaning of whatever they are required to memorize.

14. Historical Stories, Biographies and Journeys.—For pupils of the third, fourth and fifth grades, a very valuable line of oral language teaching may be based upon interesting stories from history, especially stories of colonial children, children of Japan, of China, and Indian children. Stories of the childhood of famous men (Lincoln, for example) may be used in the same way. Journeys may be taken to see places and products in which children take interest. In all such exercises adhere to facts.

15. Language Games.—Personations of birds, insects, rodents and other animals; personations of flowers, celebrated trees; personations of natural or manufactured products; celebrated characters of history (generals, inventors, philanthropists, etc.); also, celebrated events in history can be used to good advantage. In all of these, the usual formula is "I am ——," giving the distinguishing characteristics, and closing with "What is my name?"

These make good oral reviews in the various subjects and are fine exercises in oral language.

There is a game commonly called *Twenty Questions*, which is excellent for language drill above the primary grades. Each of these questions must be such as can be answered by *yes* or *no*. The leader fixes his mind upon some one person, object or event. The first questions are, "Does it belong to the animal kingdom?" "Vegetable?" "Mineral?" This being settled, other questions are asked until the leader's thought is reached.

For the primary children, simple personations of familiar birds, flowers and animals are better. The rhyming word can also be used. The leader has some word in mind that is to be found out by the other pupils, for instance, a word that rhymes with *my*. The questions asked may be "Is it good to eat?" The leader replies, "No, it is not *pie*." "Is it what I see with?" "It is not *eye*." And so on, until some one asks: "Does it mean to weep?" "Yes, it is *cry*."

16. **Language and Drawing.**—Drawing should often be combined with words in a lesson to make the ideas more vivid to the child; also, to assist his memory when first he is attempting either oral or written reproductions. For example, the youngest children of the first grade may find it difficult to tell even so simple a thing as *The Old Woman Who Lived in a Shoe.* In such cases, a few outline drawings suggesting the chief objects or actors would make the reproduction an easy matter.

17. **Written Language.**—The earliest lessons in written language are the recognition of the written or printed forms of familiar words, building these words with splints, lentils or alphabets, and copying the same words on slates or blackboards. See the lessons on reading for details as to this work, the teaching of capital letters and punctuation, the writing of the child's name, home address, father's name, names of the days of the week and month, name of the school, etc.

The secret of success in teaching the correct use of capitals, punctuation, paragraphing—all that pertains to the forms of written language, may be found in the following rules: (1) No incorrect form should appear in the teacher's own work or in what she puts before the pupil. (2) No incorrect form in copied or original work by the pupil should be allowed to pass unnoticed or uncorrected. (3) As before stated, criticisms should be made gently and impersonally. No child should ever be permitted to feel that it is himself rather than his work that is criticised. (4) There should be endless repetitions of the correct forms. Incorrect forms that occur in the pupil's work should be quickly erased and replaced by correct ones. (5) No new form of written language should be attempted until the same thing has been given orally and so used until it is familiar to the class.

18. Steps in Written Work.—All the first efforts of the child should be limited to some form of copying from correct models. At first, the exercise should not require more than the child's own name, owing to the difficulties he has with penmanship. As these difficulties are overcome slowly, the exercises must increase in length very gradually.

The second step may well be the written reproduction of one or more facts brought out in the nature study lessons. These reproductions should be answers to guiding questions placed upon the board. Here, again, the teacher must remember not to increase the number of questions beyond what the pupils can answer correctly and neatly in the time allowed. It is necessary to ward off discouragement and develop the child's confidence in this new line of endeavor.

The chief difficulty on the teacher's part will be to prepare the questions in such wise as to bring out in the answers the principal points in the order of their occurrence, so that the reproduced story may have the same continuity as the original one. This is of much importance, as it is the simple beginning upon which a clear, lucid style depends.

To illustrate simplicity and grouping, the following questions are given. They may be used after the pupils have been made entirely familiar with the facts by oral lessons:

What is the color of your kitty?
What is her coat made of?
What is her name?
What does your kitty eat?
How often do you feed her?
What meat does she get for herself?
What food does she like best?
How does your kitty's tongue feel?
When does she use it like a spoon?
When does she use it like a sponge?
Why does kitty have sharp claws?
When does she use her claws?

The answers, given in consecutive order, form the story desired. Note that the questions, at first, supply most of the words that will be needed in the answers, thus aiding the spelling as well as the construction of sentences. The number of questions and the degree of difficulty must be governed by the grade and the ability of the class and the time allowed for the work.

Cautions. 1. No questions should be asked that the pupils can not answer from knowledge previously acquired in oral lessons.

2. The time devoted to a written exercise in language should not exceed twenty minutes, even for the third year pupils. For first year pupils, from ten to fifteen minutes, and for the second grade, from fifteen to twenty minutes are the maximum limits.

3. Teachers must remember to make the first questions very simple and limit them to three or four, gradually increasing the number to ten for the last part of the first year, fifteen for the second and twenty for the third year.

4. When the answers require any difficult thinking, the questions must be reduced in number. If the questions require too much work for the time allowed, the pupils become discouraged and cease to try.

5. Correlate the work carefully with spelling and penmanship, commending according to the effort made, correctness of statements and neatness of work.

6. Save the papers and use the stories in a subsequent reading lesson.

7. Correct errors in spelling, capitalization, syllabication and punctuation in the next spelling period or in the next language period.

8. Mark the errors, but do not tell the class who made the errors. Say, "I found so and so on this paper." Then read the sentence and call for corrections of (*a*) facts, (*b*) form. Often the one who made the error will be the first to correct it, the ear helping to detect what the eye had overlooked because of the struggle with the difficult written forms.

9. Assign enough work to keep the quickest ones busy the full time, but do not require the weaker ones to do all of it. Better say, "I wish all the class to answer the first five (more or less) questions, and all who can may answer every one of them."

10. Avoid stilted phraseology in the questions. Always use good English and keep to simple forms.

11. The danger always is that the teacher will expect too much and give so much written work that the result is poor spelling, poor penmanship, errors of all kinds and general discouragement.

19. Picture Lessons.—Pictures may, if desired, form the basis of many interesting and profitable lessons in oral language during the first year. In their study, the teacher's questions should be carefully framed so as to

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direct the order of the child's observation as well as expression, until a logical habit in each has been thoroughly established.

During the first months of school, the little people are prone to make use of fragments rather than of whole sentences. As diffidence wears off and their vocabulary increases, they gradually acquire considerable fluency in the use of oral language. The element of continuity is still very weak and not to be trusted; hence, for all forms of written work, outline questions should be prepared according to the foregoing instructions, to serve as a guide for the work required.

When pictures are used for language lessons, always present those that are correct, interesting, suited to age of pupils and not so crowded with details as to obscure the story the picture should tell. (See Lesson Two, paragraph 8, *Decorations.*) The full-page illustrations used in this volume are types of pictures suited to primary grades.

As before stated, oral lessons should precede the written ones, all through the first two years and during the greater part of the third year, because of the mechanical difficulties attendant upon written language.

20. Outline for Last Month of First Year.—Take Millais's *Lilacs*,[1] for example. The following questions may be used first in a conversational lesson, the answers given orally by the class, written upon the board as obtained, then used later for a reading lesson. The answers may then be erased, leaving before the class as the basis of the written work the questions only.

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[1] These questions may be used for oral lessons earlier, but spelling and penmanship make so much trouble that this kind of written work, and that based upon literature, should be saved for the last of the year. Even then, the picture should be newly presented, the questions asked orally and the various points to observe carefully indicated before the class begin to write the answers.

(*a*) THE QUESTIONS.
Give this little girl a name.
What has she in her lap?
What shape are lilac blossoms?
What color are they?
Where do they grow?
Where do you think (Jane?) got her lilacs?
Why is she looking upward?
What kind of weather do you think it is?
Why do you think so? (Look at the picture carefully.)
Where have you seen lilacs?

(*b*) THE STORY (APPROXIMATE).
This little girl is Dorothy.
Dorothy has some lilacs in her lap.
Lilac blossoms are plume-shaped.
Some lilac plumes are white. Some are purple.
Lilacs grow on tall bushes.
I think Dorothy's father gave her the lilacs.
She is looking up to see her father pick them.
I think it is warm weather.
Dorothy has on a thin dress and is bareheaded.
I have seen lilacs in the park.

Cautions. 1. Do not try to get the same name nor exactly the same conclusion from the various members of the class. The form is to serve as a guide, but not to restrict originality, save when the child's imagination is liable to run away with the facts.

2. Notice that the questions are to be so framed as to include (*a*) the introduction, (*b*) the development, (*c*) the conclusion—the three necessary elements to every story.

3. The last answer might be, "I have seen lilacs in the

yard at home—out in the country—at my grandmother's," etc.

4. In case a child voluntarily adds one or two sentences beyond what is required, do not discourage the effort, so long as what is added is consistent and properly related. Such additions seldom occur in the written work, prior to the last part of the third year, but occur earlier and more frequently in the oral work of all the primary grades.

21. Lesson for Latter Part of the Second Year.—(*a*) BLACKBOARD OUTLINE. Use the same picture. Study the picture carefully; see all you can.

Play you are the little girl.
Talk for her and tell what your name is.
Tell what you have in your lap.
Tell where you got them.
Tell where they grew.
Tell how they came in your lap.
Tell why you are looking upward.
Tell the color of your flowers.
Tell what shape these blossoms are.
Tell why you are bareheaded and have on a thin dress.
Tell what time of year it is.
Tell what you will do with these lilacs.
Tell why you will do this.
Tell where else you have seen lilacs growing.

(*b*) THE STORY (APPROXIMATE).
My name is Dorothy Quincy.
I have some lilacs in my lap.
My father gave them to me.
They grew on a tall bush on our lawn.
Father dropped them into my lap.
I am looking up to see him pick some more.
My lilacs are purple.

They look like purple plumes.
I am bareheaded and have on my white dress because it is a warm day.
It is the last part of May.
I shall give my lilacs to my grandmother.
She loves them very much.
I used to see lilacs in grandmother's dooryard.

Caution. If the boys make objections to writing this story, use for them another picture in which a boy or some animal is the chief element. It is often well to use two pictures in this and higher grades, since more variety is thus secured and the corrections are less monotonous.

22. For the Third Grade.—(*a*) GENERAL INSTRUCTIONS. Use the same picture as before. This time let the children personate the lilacs and tell their story. Each teacher will necessarily vary the outline to draw out the facts that her own class has previously learned from a study of lilacs.

(*b*) THE STORY (APPROXIMATE).
I am a lilac blossom.
I grew on a tall, strong bush on the lawn.
Do you see where I am ?
I am lying in little Dorothy's lap.
Some of my sister blossoms are with me.
Little Dorothy loves us very much.
Her father dropped us into her lap.
Do you see her looking up for more ?
I think she wants her lap full of lilacs!
The bush has more than enough to fill it.
Do you know lilac blossoms ?
We look like lovely plumes.
The lilacs Dorothy has are purple.
We have some cousins that are white.

You can smell our sweet breath a long way off. Dorothy's grandmother says she feels sure that spring has really come when she sees the lilacs.

Our mother bush is strong and hardy. She lives year after year out on the lawn. Her strong, tough roots hold her firmly in the ground.

Her stems are strong and woody and are covered with a smooth, brown bark.

In the month of April, her leaf buds swell and her green leaves come out. The blossoms do not come until May.

Dorothy will give most of her flowers to her grandmother. But I think some of the purple plumes will be turned into purple chains. Dorothy likes to make lilac chains. Do you?

Cautions. 1. Do not expect connected written stories until there has been a great deal of practice in telling stories orally. Fluency of speech comes only by long practice, and fluency with the pen is vastly more difficult; hence, teachers need to be patient with slow results.

2. Very great care must be taken with the outlines, or the stories will never acquire the desired continuity and logical development according to the facts.

3. Children of the first three grades should not be expected to arrange sentences into paragraphs without aid.

4. Logical sequence of ideas, choice of words, correct spelling, capitalization, punctuation and syllabication will furnish more than enough difficulties for the primary grades. Even these, unless constantly worked with, will not be conquered for several years to come; hence, no original paragraphing should be attempted by primary pupils.

5. When copying is required, it should always be in paragraphs, if the original is so arranged. From much copying, the form of the paragraph and its underlying ideas

gradually become impressed, if the teacher wisely draws frequent attention to the groups of sentences, speaks of paragraphs by name, and shows why the groups are formed.

6. Keep constantly in mind that all forms of constructive language should become familiar to the children first by means of oral language. The mind may then concentrate upon the form of construction without the attention being distracted by the requirements of spelling, punctuation and penmanship. This rule should be strictly followed, since, in written expression, one part of the work must be, to a great extent, automatic.

7. The outlines and suggestions given for the lessons on *Lilacs* can be used as types of the work to be done when using other pictures as the basis of written lessons.

23. Other Subjects for Lessons.—The same principles underlie lessons based upon flowers or other actual objects belonging to the world of nature; also to those based upon interesting manufactured articles, such as toys, textile fabrics, bird-houses, doll-houses, articles of furniture and the like.

In each case, the illustration is to be carefully studied first-hand. Observation for ideas, then oral language for expression, and, last, expression by means of standard written forms is the invariable order to be followed.

24. Language through Literature.—With older pupils, and with primary pupils to a limited degree, the subject of the written lesson may be intangible in form, derived from a fable, anecdote, story or poem told or read to the class. Then follows much practice in oral reproduction; later, a very brief written reproduction and, later still, a written longer reproduction with or without the help of questions, according to the age and advancement of the pupils.

Brief written reviews may also be required, in connection with the various oral lessons given.

25. Written Reviews.—The following suggest what may be used during the last part of the first year of school, providing the proper lessons have been given and oral reviews previously required. Give one, two or three questions for one lesson.

(*a*) BLACKBOARD OUTLINE. *Mother Nature's House.*
What is Mother Nature's house?
What color is her house in spring and summer?
What color is it in November?
What color is it in winter?
How does Mother Nature sweep her house?
What is her strongest broom?
How does she wash her windows?
How does she get her scrubbing done?
How is her house dried and warmed?

(*b*) THE STORY (APPROXIMATE).
The earth is Mother Nature's house.
It is green in spring and summer.
In November it is brown.
In winter it is white.
Mother Nature sweeps her house with the winds.
The March wind is her strongest broom.
She washes her windows with April showers.
The rains do her scrubbing.
The sun dries and warms her house.

26. For the Latter Part of Second Year.—(*a*) BLACKBOARD OUTLINE. *Mother Nature's Carpets.*
Does Mother Nature use the same carpet all the year?
When is her carpet brown?
When does she use a soft white carpet?
How is this carpet made?
When and how is this white carpet destroyed?
What is the color of Mother Nature's spring carpet?

What flowers do you find in this pattern?

How often is this flower-pattern changed?

What flowers do you find in Mother Nature's August and September carpet?

What are scattered all over her October carpet?

Which of Mother Nature's carpets do girls like best?

Which one do boys like best?

Which of Mother Nature's carpets is used the longest without much change?

(*b*) THE STORY (APPROXIMATE).

Mother Nature does not use one carpet all the year.

Her carpet is brown in November.

It is soft and white in winter.

This white carpet is made by the snowflakes.

The sun and the south wind spoil it in the spring.

Mother Nature's spring carpet is green.

There are yellow dandelions and blue violets and some other flowers in the pattern.

The pattern is changed every month from May to October.

In August and September, Mother Nature's carpet has asters and goldenrod and pansies in the pattern.

The October carpet has bright leaves all over it.

Most girls like the spring carpet the best, but some like the October carpet the most.

Boys like Mother Nature's October carpet and her winter carpet.

I think the winter carpet is used the longest.

Caution. Remember that these answers will vary somewhat according to locality.

27. For the Last Part of the Third Year.—(*a*) BLACKBOARD OUTLINE. *Mother Nature's Children.*

Name some of Mother Nature's children.

Which ones can run very fast?
Which ones have the prettiest clothing?
Which ones are the tallest?
Which ones always carry lanterns?
Which ones make honey?
Which ones make paper houses?
Which ones furnish sugar?
Which ones give us nuts?
Which ones furnish music?
Which ones always have needles to spare?
Which of the children are carpenters?
Which ones are masons?
Which ones are drummers?
Which ones are weavers?
Which ones are tunnel diggers?
Which ones are fishermen?
Which ones are divers?

Which of Mother Nature's children sleep several months of the year?

When does she awaken them?

Which of Mother Nature's children give the most help to people?

Which of her children do you like the most?

(*b*) THE STORY (APPROXIMATE).

Horses, cows, sheep, birds, insects, reptiles, flowers, trees—all kinds of animals and all kinds of plants are Mother Nature's children.

Rabbits, deer and squirrels can run very fast.

Flowers, birds and butterflies wear the prettiest clothes.

The trees are the tallest of the children.

The fireflies always carry lanterns.

Bees make honey.

Wasps make paper houses.

Sugar cane, beets and maple trees give us sugar.

The beech, walnut, oak, butternut, chestnut, almond and some other trees give us nuts.

The birds, insects, frogs and toads furnish the music.

The pine tree has thousands of needles.

The woodpeckers and beavers are carpenters.

Barn swallows, bank swallows, swifts and beavers are masons.

Partridges and woodpeckers are drummers.

Orioles, vireos and a few other birds are weavers.

Woodchucks and moles dig tunnels.

Fish-hawks are fishermen.

All kinds of ducks are divers.

Woodchucks, bears, frogs, toads, snakes and many plants sleep all winter.

Mother Nature wakes all of them in the spring.

I think cows and horses help people more than most of the children.

I like to look at all of Mother Nature's children, but I don't want snakes and tigers and lions near me when they are loose.

Cautions. 1. Keep in mind that similar reviews may be written, having all the questions limited to one topic, as trees, flowers, bees, butterflies, frogs, etc. The one above is general in character and should not be attempted until a great many specific reviews, both oral and written, have been given.

2. Do not attempt to secure uniform answers. Encourage originality of expression so long as the work is correct in regard to facts and forms.

3. Adapt the review questions to suit the locality as well as the ability of the pupils.

4. Be extremely careful that all blackboard work is

absolutely correct in all respects. Pupils do not need the teacher's example to teach them careless habits.

5. The lessons written by the children, by the aid of blackboard outlines, usually result in a story having considerable continuity and a fair degree of smoothness in language and style. Occasionally, an exercise like the last is given, in which the purpose is chiefly to test the knowledge of the pupils. In such exercises, however, the law of association should be kept in mind and the questions should be arranged accordingly.

6. These written exercises are preparing the way for more difficult work on composition writing in later years. Owing to the dread that pupils feel when the word *composition* is used, it is better to speak of written reviews, tests and so on, and let the pupils really write compositions without thinking of doing so.

7. To keep out errors and prevent discouragement, the motto must be "Slow and sure."

8. Teach all pupils that accuracy and neatness always rank higher than speed. Speed and fluency will come from repetition and practice. The results will be more rapid as the difficulties of penmanship and mechanical forms are conquered.

9. Let children "learn to do by doing"; give written exercises frequently, having every new form first presented and drilled upon orally.

10. The written work as outlined will be too difficult to finish in the third grade and should be carried into the fourth and fifth grades, and possibly higher.

28. Initials and Abbreviations.—Before the third year closes, the children should be taught how to write initial letters instead of full names, when desired. They should also be taught how to use the simpler forms of abbreviations, as those for the days of the week, months of the year and for their native country and state. Exercises on these may be given to fill some of the periods for seat work. The learning of abbreviations should be extended into the fourth year and continued until all those in common use are mastered.

Abbreviations are uninteresting of themselves, hence difficult to learn. Matches, conducted like spelling matches, will be found a stimulant to study and cause the work to be finished more quickly and easily.

Caution. It should not be forgotten that all the language forms begun in the primary grades need lifelong practice in order to keep them perfectly in mind on all occasions.

29. Teaching English to Foreigners.—There are many children who enter our schools without even a speaking knowledge of the English language. These are seriously handicapped when classed with pupils who have never used or heard any other language than English.

With the children of foreign parentage, both ear and eye must have constant and careful training; with the strictly American children, the ear is already trained and a large spoken vocabulary is freely used, all of which proves that a double work must be done for the less fortunate pupils or they will remain hopelessly behind their classmates.

Added to the timidity that all children feel upon entering school, those who have little or no knowledge of our language are rendered painfully self-conscious because of the awkward prominence in which they are placed.

How to help such children learn English, in the shortest time possible, is the problem that confronts the teacher. The best method to follow is to help them, first, to become well acquainted with the other members of the class, since children always learn from children much faster than from adults. No notice of any sort should be taken of their awkwardness. Not a word, look or gesture should cause them to remember that they are different from the rest of the class.

All general directions for the school or for the class should be given in English, but, for some time, interpreted by some pupil that has a knowledge of both languages. If no such pupil is at hand, resort to the most expressive pantomime that can be invented. In a surprisingly short time, the interpretations will not be necessary, unless a new pupil enters or a new form of instruction is introduced.

The utmost kindness and tact will be needed to win the full confidence of these little strangers and wear away their natural embarrassment. (The other children should be talked to privately and their friendly coöperation secured.) On the playground their tendency will be to withdraw from the others and spend the time talking together in their native language. This should quietly, tactfully but persistently be prevented. See that they are drawn into all the games and induced to participate in them. Thus the ear will get constant training and the interest and excitement of the sport will lead them to talk English with some freedom, long before the more formal indoor exercises bring this result.

The words that they will most quickly learn are the school commands, nouns that can be clearly illustrated by objects, and verbs of action. The latter may be illustrated perfectly by having the action performed each time one of these verbs is used. The order should be (1) the spoken word, (2) the action, (3) the written word. The latter should remain upon the board or special chart, to impress itself upon the eye and become familiar to all the class.

Other words must be used as needed and the law of association will help these children to become familiar with them. Frequent drills upon words and sounds that are found to be especially difficult should be given daily to the whole school, the teacher showing all the pupils just how to manage the vocal organs in order to enunciate properly.

Suppose certain children say *den* for *then*. All should be instructed to watch the teacher and do as she does. Place the tongue firmly against the lower edge of the upper teeth and hold it there while *then* is sounded. This will make it impossible to say *den* and will bring the correct pronunciation. Similar instruction must be given for other troublesome sounds. Much more drill in phonics is needed than for pupils from American homes. Much more practice in speaking English is necessary and all legitimate means must be used to secure the needed amount.

Among the first phrases, they should learn such as form the social currency of polite society: *please*, *if you please*, *thank you*, *good-bye*, *good morning*, *good night*, *how do you do;* and to prevent the wrong use of *can: may I go*, *do*, *have*, etc.

Surround these foreign children with an atmosphere that is kind, sympathetic and courteous. Keep them doing things in response to English requests or commands. Keep them speaking and reading English. Have them build or write the words with the others and enter into all exercises that the others have; also provide special exercises.

This is the hardest language problem that confronts the teacher, but it has been successfully worked out, time and again, by the methods suggested. Each teacher should be able to add various devices of her own by which the work may be hastened. One teacher used to send frequent pleasant greetings (in English) to the parents. Another had each little memory gem repeated at home. Another induced the children to play school at home, to show father and mother what we do at school.

Cautions. 1. The teacher confronted by this problem can do much towards solving it by comparing the elementary sounds in the two languages and noticing those that are not common to both. The children will have difficulty in articulating only those sounds in the English not found in their own language, and it is to these that special attention should be given.

2. Remember that the difficulty which these children have to overcome is physiological, so teach them how to use their vocal organs; then give frequent drills on the pronunciation of the difficult sounds. Simply pronouncing words to these pupils is time and effort wasted.

30. Letter Writing.—Children are always intensely interested in sending and receiving letters; hence, even during the first year, something of letter writing may be introduced with pleasure and profit. A tiny letter to Santa Claus just before Christmas will make a pleasing beginning in this line. In this, the pupils should carefully copy the forms for opening and closing from models written on the board by the teacher. They should also copy the superscription for the envelope. The body of the letter should be original but very brief. Usually this part consists of but one or two short sentences, in which Santa Claus is told what present is most desired at Christmas time.

The next attempt may be deferred until February and consist of a little valentine to father or mother, or to both. If other letters are written during the year, one may be an invitation to a birthday party, and another a little note of thanks for some real or imaginary gift or favor. These four will be quite enough. They should conform in all respects to the forms prescribed by correct usage, and be written with the utmost care. Much greater interest will be felt if correct note paper can be used and the letters sent through the regular postoffice or delivered by a special messenger.

In all these efforts, the writers should be permitted to ask how to make any letter, how to spell any word or how to use any mark of punctuation. Pride must be called in to secure correctness and neatness.

During the second and third years, the letters may be a little longer and a little more frequent. A letter to some dear friend or relative may be written after Christmas to tell of gifts. One may be written after a birthday or picnic, telling how the day was spent. Boys may write to some chum and describe a dog or some other pet animal, a new sled, a nutting party, a toboggan slide, etc.

Caution. It is all-important that the writer has something of vivid interest to himself that he may make the cause of his letter; therefore, study the children individually, to learn of their tastes and their personal belongings, before assigning the topics for letters. The teacher should never ask children to write letters or other exercises upon abstract themes.

31. Conclusion.—No special text-book on language is needed for the use of primary pupils. Teachers should have several good grammars at hand for reference, but should be so familiar with the subject as to make frequent reference unnecessary.

During the first two years, no separate period is needed for either oral or written language. The oral language is a necessary part of every school exercise, both formal and informal. The small amount of written work required may be done in some of the periods allotted to seat work. Slates and pencils, blackboard and crayons should be used alternately, in order that change of position and change for the different sets of muscles used may be obtained.

In the third year, and beyond, the greater part of the oral language work continues as a part of the other school exercises. A separate period is needed for the written work, the technical forms being more numerous and difficult and the exercises of greater length.

Each method of teaching language has its ardent devotees, and it is seldom that a method is projected that is wholly without merit. Some few of the many have numerous excellent points to commend them. However, it remains true that as long as children, localities and environment differ as they do to-day, no one method will be able to meet all the requirements made by these differences

32. Bibliography.—There are numerous grammars and language books on the market, many of which are too well known to need mention here.

Among the later ones published, in which are found helpful suggestions for teaching language, chiefly for pupils beyond the third grade, are the following:

Cooley, Mrs., *Language Lessons from Literature, Book One*, Houghton, Mifflin & Co., Chicago	$0.45
Metcalf & Bright, *Language Exercises*, American Book Company, Chicago	35
Rankin, Mrs., *Everyday English, Book One*, Educational Publishing Company, Chicago	.50
Southworth & Goddard, *Elements of Composition and Grammar*, Benj. H. Sanborn & Co., Chicago	.60

TEST QUESTIONS

1. Of the children living in the country and those living in the city, which do you think are the better prepared for language work when they enter school? Give your reasons for your answer.

2. What mental powers are trained by requiring pupils to reproduce stories that are told or read to them? Are there any dangers for the teacher to guard against in such an exercise? If so, what are they?

3. What do you understand by "every lesson a language

lesson" (1) as it applies to the teacher? (2) as it applies to the pupils?

4. Why should similes and metaphors be taught in primary grades? What figures of speech are frequently used too much in these grades?

5. What do you expect your pupils to gain from memorizing short poems and other selections of choice literature? How will you teach these lessons so as to secure the desired results?

6. How can the written exercises in other subjects be made to assist the work in language? How do these exercises often hinder the work in language?

7. What do pupils gain from copying stanzas of poetry and short paragraphs from selections of prose? What must the teacher do to have them derive the greatest benefit from this exercise?

8. To what extent should letter writing be taught in the third grade? Outline a lesson for beginning this work.

9. Why are children so prone to use the incorrect language learned at home and on the playground, instead of the correct forms learned at school? How can this tendency be lessened?

10. Is it wise to have pupils criticise one another's language? Why?

A SCOTCH MOUNTAIN AND HIGHLAND COTTAGE
From a photograph.

LESSON EIGHTEEN

GEOGRAPHY

1. What Geography Includes.—"Geography is not a simple science by itself, like botany or geology or astronomy, but a collection of sciences levied upon to describe the earth as the dwelling place of man, and to explain something of its more important features. About one-fourth of the material relates strictly to geography; about one-half to the inhabitants, their manners, customs, institutions, industries, and the remaining one-fourth is drawn from the sciences of mineralogy, botany, zoölogy and astronomy."—*Committee of Fifteen.*

From the above statement it is clearly seen that geography is related to all human interests, and that within its scope it includes the various branches of natural science, history and much of literature. It deals with both the past and the present, and to its store of facts are added yearly those which mark the material progress of mankind.

2. The Teacher's Preparation.—(*a*) KNOWLEDGE. That the teacher may succeed in teaching so complex a subject, it is first of all necessary that she should have at least an elementary knowledge of those branches to which geography is closely related. Particularly is it necessary that she be acquainted with botany, zoölogy, physiography and meteorology. Without a knowledge of these branches, the teacher of geography will find herself constantly handicapped, and for this reason unable to make the subject interesting or profitable to the pupils.

(*b*) DESCRIPTIVE POWER. The teacher of geography must possess or cultivate the art of graphic description. She should be able to give clear, connected and interesting descriptions of places, peoples, events, plants and animals. Many teachers possess this power to a marked degree, and all can acquire it by careful study and by reading good books of travel and narratives.

The successful teacher of geography should be able to sketch rapidly and with a good degree of accuracy, both on the blackboard and on paper. The importance of this ability can scarcely be overestimated. Oftentimes a few lines on the board will give the class a clearer idea of a river system, mountain range, coast line or island than any amount of verbal description. Drawings do not need to be elaborate or even carefully finished, but they should be such as the teacher can make while she talks to her class, and every line in them should have a meaning. What may be done in a simple manner by the use of the crayon is illustrated in the figures on page 491. Ability to draw on paper is necessary because the teacher often needs to assist pupils by showing them how to sketch maps and many other objects needful to illustrate their geography work.

(*c*) MATERIAL. The geography teacher should gather and constantly have on hand a stock of material specially adapted to the work of the grade in which she is giving instruction. One of the most valuable portions of this material will be pictures which she can secure from magazines, daily papers and many other sources. Especially helpful are the pictures obtained from circulars distributed by the large railway and steamship companies. Descriptive catalogues of large manufacturing firms and other leading wholesale and retail establishments also contain a great deal of material that can be used. These pictures should be mounted on heavy manila paper or light cardboard. As far

as possible, the mounts should be all the same size. The title and, when necessary, a brief description should be written under the picture. The pictures should then be filed either alphabetically or by locality, as by state and country. Large envelopes are both cheap and convenient for the purpose. By embracing every opportunity, a teacher can collect in this way a very valuable set of pictures in a short time.

Of equal value to the picture cabinet will be the scrap cabinet, if the selections are as carefully and faithfully made. There is not an issue of a daily paper but that contains more or less geographical information of value to the teacher. Many articles in educational journals are written especially for the purpose of assisting primary teachers in geography. Others are found in magazines, and still others can be obtained from various sources. Expensive apparatus is not essential for the preservation of these scraps. By placing them in large envelopes, writing upon the outside of the envelope the title of each article included, and arranging them either according to locality or alphabetically, they are always easily found and made ready for use. Scraps should never be pasted into a scrapbook. It is impossible to arrange them logically, and oftentimes the clippings are printed on both sides, so that only a portion of them can be preserved in this manner.

(*d*) PLANS. The teacher of primary grades in planning her work should see its relation to geography and see the part that each lesson has in the entire system of instruction in this subject. Having thoroughly mastered this part of the problem, she should then plan the work of her grade so as to have it closely related, as far as it treats of geography, to the work of the grades that follow. In order that she may do this wisely, it is well even for the primary teacher to have a good knowledge of the primary geography to be used farther on.

In selecting geography subjects for primary grades, the teacher should be guided by (1) the adaptation of the subject to the capacity of the children, (2) its adaptation to the season of the year, (3) its ability to be easily related to other departments. To illustrate: the lessons in nature study are easily related to geography. They are also closely related to drawing and language, and occasionally to number lessons. Frequently subjects, otherwise equally proper, might be selected for primary grades were it not for the fact that they are of such nature that they are not easily related to the other work of the school. It is usually wise to omit such subjects.

(*e*) The Daily Lesson. Aside from her general preparation for teaching geography, there is a special preparation that is vital to the teacher's success. This is the preparation on each day's lesson. Having fixed upon her plan for the term, the teacher should determine as far as possible beforehand what she will accomplish each month, and then what portion of the month's work shall be covered each week. When this has been done, she is in a position to plan and prepare her daily lessons wisely. This preparation should include the selection of the subject for the lesson, and a thorough study of the subject for the purpose of presenting it to the class so as to bring out the desired points. This study should include the general line of questioning necessary to lead the class to discover the desired facts and principles. In addition to this, the teacher should prepare to give one or more interesting facts or incidents, to relate an anecdote or read or repeat a short poem or other literary selection especially suited to the lesson.

3. **Excursions.**—All of the geography lessons in the primary grades have to do with the immediate neighborhood, and often lessons can be made more effective by taking the class to the place where the object under consideration can be studied. In a rural school the teacher can usually find the necessary material within a short distance of the school-

house, but in towns it is frequently necessary to take the class several blocks. When excursions that involve traveling long distances or that are to take the children away from school for some length of time are planned, this fact should be stated one or two days beforehand and each member of the class should be asked to obtain permission from his parents to accompany the excursion. This will prevent any objections arising afterwards and also show that the teacher desires to coöperate with the parents.

When an excursion is decided upon, it should be carefully planned. The teacher should visit the place beforehand and make a thorough study of it to determine just what she wishes the class to observe. In case the excursion is to a manufactory or a store, the proprietor should be consulted and his permission for the visit obtained. The children should be kept together and their observation should be directed by the teacher; otherwise many of them will be bewildered by the numerous sights and will fail to systematically observe anything. With young children, only the most important facts should be considered. If minute details are attempted, the children will become confused and on the following day only a few of them will be able to give a connected account of what was seen.

The excursion should always be followed by a discussion of the trip, in which each pupil should be called upon to state what he learned. The teacher should not be discouraged if these first attempts are seemingly failures. She will find that one child saw one thing and another another, notwithstanding the fact that the attention of the class was directed to the same objects. However, by putting together the points brought out by the various pupils, a connected and reasonably systematic account will be obtained. This should be re-stated to the class by the teacher in such a manner that all can remember it, and from day to day it should be called up until each pupil is able to give a connected account of what was learned during the trip.

Cautions. 1. In reviewing the excursion, after the first lesson only a few moments of each recitation should be given to it; otherwise the children will become tired of the subject and lose interest.

2. It is not advisable to make excursions with small children to places where any danger will be incurred. In case a factory, foundry or other similar place is to be visited, enough older pupils or adults should accompany the teacher to provide every child with a suitable escort; otherwise serious accidents may happen.

4. The Study of Types.—(*a*) IMPORTANCE. The excursion brings us to an important phase of geography teaching. This is the study of a few objects or phenomena as types of the classes which they represent. The multitude of subjects contained in geography precludes even so much as the briefest consideration of many; therefore others, especially those that, on account of their relation to the subject as a whole, are the most important, must be selected for study. The study of one river from its source to its mouth will give the pupils a good idea of nearly all rivers. Likewise, the study of a prominent mountain, like Pike's Peak with all its surroundings, prepares for the study of all mountains, and as the connection of this peak with others is shown, the idea of the mountain range is developed. The study of Lake Michigan embraces all the facts common to the Great Lakes. This is also true in all lines of industry. The study of a single coal mine, wheat field, lumber mill or factory will give the class tangible and definite ideas of the great industry to which each belongs.

(*b*) METHOD. While fraught with great possibilities, the study of types may result in failure unless the work is carefully planned and executed. The teacher's plan should include the selection of material, her own preparation for the recitation and for securing from the pupils the desired results.

In selecting material, the teacher should be guided by the capacity of the class, the means for preparing the lesson and the interest that the subject will awaken in the pupils. With pupils of the second and third grades, the lessons should deal with those things with which the class is somewhat familiar, and should not be on subjects too difficult for them to understand; neither should they be on subjects whose relations to other subjects are not easily seen. In the rural schools of Illinois and Iowa, such subjects as corn and milk are excellent. In towns, some leading manufacture or other occupation can be chosen. In either case, the teacher should begin by selecting the subject that she can use to best advantage, and in the lower grades the studies should always be confined to those subjects which can be illustrated from material easily obtainable.

The teacher must plan the lesson carefully. She should become thoroughly familiar with the subject, obtaining as far as possible her knowledge at first hand. This may be done by visiting the place and by making inquiries of others. If an industry is to be studied, the teacher should visit the factory, learn all she can by her own observation and supplement this knowledge by conversation with those engaged in the work. Having obtained this knowledge, she should so arrange it that she can give clear, vivid and interesting descriptions of what she has seen, and also show the relation of the subject under consideration to other subjects; as, in the study of milk, it is not only necessary that the teacher be able to give a full account of how milk is obtained and of its uses on the farm, but she should also be able to explain the relation of the farm dairy to the creamery, and of the creamery to the supplying of the people in the great cities with butter and cheese. Transportation of milk to such cities as Chicago, Saint Louis or any large city to which it is shipped should also be noted.

In the preparation of the lesson, the teacher should also decide upon what information she will give the pupils for the purpose of arousing their interest in the subject, and what information she will ask them to obtain for themselves. At the recitation following the laying out of the work, each pupil should report upon his progress. These reports will enable the teacher to direct the activities of the children more definitely, and will show also what information the pupils are unable to obtain and what she should supply at that time. It will probably require several recitations to complete the work, and before the subject is dropped each pupil should be able to give in good language a connected account of what has been studied.

(*c*) REVIEWS. Type studies are excellent for reviews, especially when the subject has been pursued in a somewhat disconnected manner, as frequently happens in following the plan of the text-book in primary geography. By preparing outlines for the pupils to use in studying their review lessons, all related topics can thus be connected. In the review of the Mississippi Basin, one outline would take up the study of the main river from source to mouth; another would treat of the tributaries; a third, the nature of the country; a fourth, the industries in the basin; a fifth, the cities, and so on until each topic covered in the study had been treated. Finally, the relation of all these topics to one another should be shown.

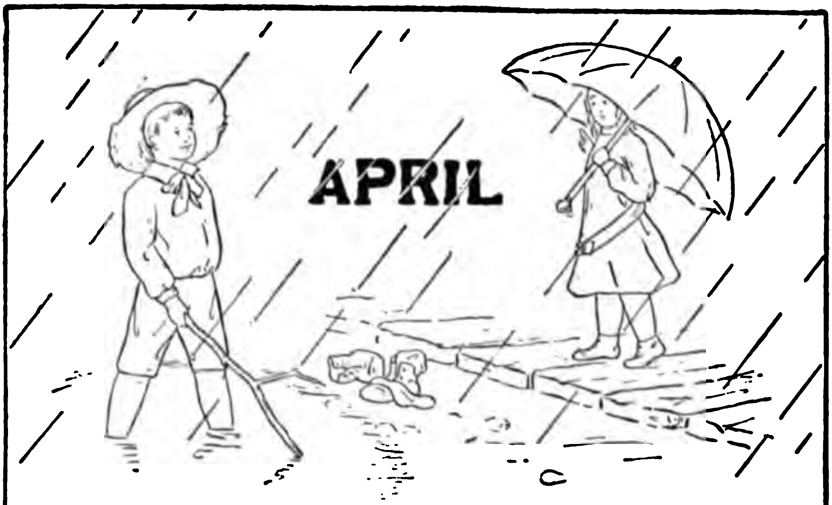
Caution. In order to obtain the most far-reaching results from the study of types, the general plan should be carefully formed and should include such a period of time as a term or a school year. The subjects selected should be of such a nature as to enable the class to obtain a connected idea of the leading facts of geography of their own county or city, according to the plan that the teacher has in mind. For the higher grades the plan will, of course, be much more extended than for the primary grades.

Studies of this sort should also be followed in the higher grades by the thorough and systematic study of a text-book.

5. Work for the First and Second Grades.—(*a*) PLANTS AND ANIMALS. The geography work of the first and second grades is along the line of nature study. In giving her lessons on plants and animals, the teacher should constantly bear in mind the relation that these lessons sustain to the geography of the higher grades. The geography phases of such lessons consist in having the pupils ascertain where the plants grow. Are they found on high or low land? In dry soil or wet soil? What are they used for by man? How do animals use them? The answers to such questions as these bring out the facts that birds use portions of some plants in building their nests; that they use the seeds of plants for food; that squirrels eat nuts and acorns, and that rabbits feed upon clover, the young shoots of shrubs and the bark of young trees. The children will discover that some plants will grow only in low, wet ground, while others require high land and a dry soil. They will also learn that some animals burrow in the ground; some make nests in the trunks of trees, while birds build their nests in various places.

In treating of the uses of plants and animals to man, only those uses should be mentioned that the children already know and can easily understand, such as the use of corn and wheat for food and the use of cotton fiber for clothing. The work should be made very simple and confined to the immediate locality. For more specific plans, see directions for nature study in Lessons Fifteen and Sixteen.

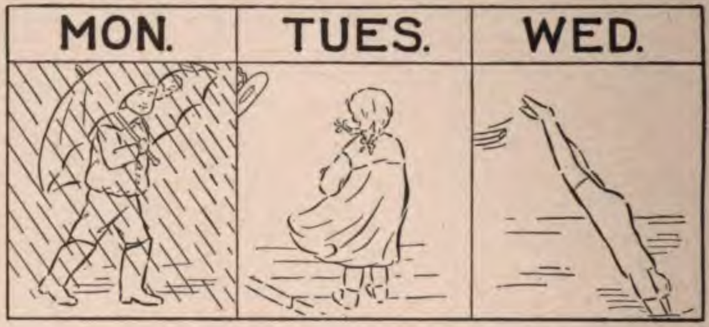
(*b*) STUDY OF THE WEATHER. Even the youngest children can be easily interested in the weather. They all love



APRIL

SUN.	MON.	TUES.	WED.	THURS.	FRI.	SAT.
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

the sunshine and many of them enjoy the rain and the snow. One of the most interesting and effective methods is to construct a weather calendar somewhat after the plan shown on page 499. The calendar may be drawn upon the board, or upon a large sheet of manila paper, if board room is scarce, and the weather by which each month is characterized indicated by drawing a picture at the top. A more elaborate calendar can be made for the week by drawing a picture in the square for each day. The illustration gives an idea for a rainy Monday, a windy Tuesday and a hot Wednesday in summer. Again, the pictures may be colored or the squares washed in with color—yellow or blue for sunshine, gray for clouds and black for rains or other storms. If the calendar is large and the teacher or some pupil in the school can do the work, much interest is added by sketching into each square some event of the day.



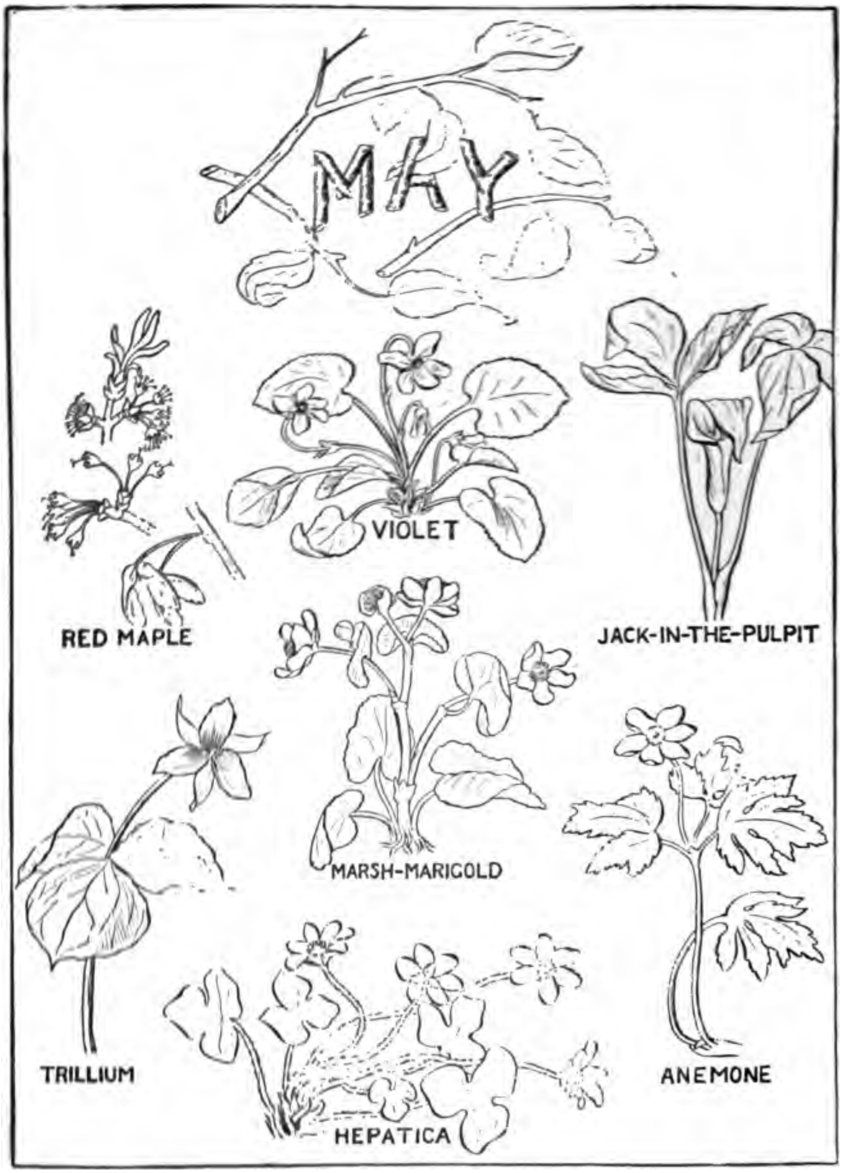
In the second grade, and especially in the last half of the year, the attention of the children should be called to the sky, leading them to notice the different forms of clouds and the rising and setting of the sun, though only the simplest facts connected with these phenomena should be dwelt upon.

Plant charts are also interesting. A plant chart for May would include the plants found blossoming in May; it might give merely the names, or the names, pictures and dates when the flowers were first seen. A plant chart might include also the seed and root of each kind of plant. For the first and second grades the chart should be simple, like the illustration on page 502.

(*c*) THE STUDY OF MATERIAL. The pupils in these grades should be made acquainted with the various materials in common use, such as wool, cotton, iron, brick, stone, lumber and asphalt. To these, if time permits, many of the commodities used in the home may be added, such as tea, coffee, sugar and spices. This is excellent work for the winter months and can take the place of the lessons in nature study that occupy the fall and spring. The work should be made very simple, and the children asked to make collections of material. They should learn to recognize the different materials from their appearance; be able to distinguish cotton from wool, iron from lead and other metals from one another.

It is not wise at this time to ask the children to distinguish different kinds of wood, as this requires too minute a study. The children will be interested in learning what parts of the plant or animal or other material are used, as the fiber of the cotton plant, the trunk of the tree for lumber, and also what substances are used in manufacturing such building material as brick and cement. The teacher should be guided in these lessons by the ability of the class to comprehend the work and by the time at her disposal. The danger is that too much will be attempted.

6. Work for the Third Grade.—(*a*) NATURE STUDY. In the beginning of the year the geography of the third grade is a continuation of and an enlargement upon the nature study of the second grade. The difference, however, lies in the fact that the geography becomes more prominent and the nature study less so.


MAY
RED MAPLE
VIOLET
JACK-IN-THE-PULPIT
MARSH-MARIGOLD
TRILLIUM
ANEMONE
HEPATICA

The pupils should now begin a systematic study of home geography. A number of topics can be considered during the year. The extent to which each can be carried will depend upon the ability of the class and upon the time at the teacher's disposal. Usually, more can be accomplished in a graded school than in a rural school where the teacher is compelled to have a large number of recitations each day. In connection with the study of plants this year, the children should have their attention called to soil, the rocks and the relation of one to the other. A little attention to this matter on the part of the teacher will soon enable the pupils to understand how soil is formed, and the brightest ones will often be able to tell why the soils in the valley and on an adjoining hillside are frequently different.

(*b*) MAPS. In this grade the children should begin the study of maps. This is best introduced by having the class draw a map of the schoolroom. The first map should be drawn by the teacher and class together. Before the lesson is completed, the children should understand what is meant by scale; also what part of the map is always used for a given direction, as the top for the north, the right hand for the east. After the map has been drawn by the pupils and teacher together, it should then be drawn by the class without the aid of the teacher. In due course of time a map of the schoolroom should be followed by one of the school grounds. Later in the year this exercise can usually be extended with profit to the sketching of a map of the neighborhood.

If the school is situated in the midst of a large town, only a small section of the town, including the block in which the school is located, and possibly an adjoining block, should be included in the map. Teachers frequently make mistakes in requiring pupils of this grade to construct a map of a city or town, the work required being altogether too complicated. In rural schools, the older pupils of this grade ought to be able in the latter part of the year to construct maps of the farms on which they live. An exercise of this sort always lends interest because of its variety.

(c) CLIMATE. The weather study of the primary grades should be extended in the third grade to include observations on the climate. These lessons should include a study of the seasons and their length and characteristics; also the months in which each season occurs. Each season should be characterized by the kind of weather which predominates. Summer is hot and winter is cold; autumn is warm and grows cold, while the spring is cool and grows warmer until it merges into summer.

The length of day and night at different seasons of the year should also be noticed. Pupils of this grade should be led to watch the position of the sun on the horizon at sunset. While they will be unable to see any change in its position from one day to another, by comparing it with some fixed object which is between them and the horizon, such as a tree or a building, in the course of a month they will discover that the sun has changed its position quite a little, and in the course of a season they will be able to note the change which relates to the difference in the length of day and night. The pupils should be led to study the moon and learn its different phases. Children of this grade can also be taught to locate the north star by its position in relation to the Great Dipper. These lessons lead them to an interest in the heavenly bodies which, as the years go on, will increase and enable them to derive much pleasure from the study of the sky.

In connection with the study of the seasons and the formation of soils, the work of water should be considered; how the rains wash the soil down into the valleys, wearing little valleys in the banks by the roadsides and in other places; how the evaporation of water forms steam or invisible vapor, according to the condition of the atmosphere, and how the rapid freezing and thawing of water crumbles the rocks and assists in the formation of soil. The formation of frost and dew and snow should also be treated. If only the simplest and most obvious facts are touched upon in these lessons, they can be made very interesting and will give the pupils much valuable information.

(*d*) SURFACE. The children already know what hills and valleys are, and if they live in a mountainous locality they know the difference between a hill and a mountain; but probably they have never had their attention called to the relation which these different surface forms sustain to one another. They should now begin a systematic study of surface. In this way only the leading features of the locality should be considered, as the highest hills, the deepest valleys, the largest streams. Later, the study can be extended to the more minute features. These lessons furnish excellent material for developing the descriptive powers of the children and are valuable aids in language work as well as in geography.

(*e*) DRAINAGE. In connection with surface, the attention of the children should be directed to important streams. They should be led to discover for themselves, if possible, why the streams flow in a given direction. It is not wise to follow this topic too far. For illustration, if the principal river nearest to the school is long, like the Illinois or the Mississippi, it is not wise to make a complete study of this river at this time, following it to its mouth and treating of its tributaries. Instead, make a study of one tributary as a type.

(*f*) PRODUCTS. These should include the principal products of the locality. They are usually divided into agricultural, mineral and manufactured. In Iowa this line of study will generally lead to a study of corn and dairy products. In Illinois it will lead to the study of grain, coal, and in some localities, numerous manufactures. In the selection of types, the teacher will be guided almost entirely by the locality.

(*g*) OCCUPATIONS. What has been said in respect to the selection of topics in products applies here. In connection with these topics the pupils should be led to see the necessity for different occupations; as, why one man is a farmer, another a blacksmith, another a merchant, and to realize the dependence that the various occupations of the community have upon one another.

(*h*) MEANS OF TRAVEL. This includes a study of roads and railroads in the immediate locality, and, if upon a navigable river or other body of water, the boat lines. This should not be carried too far. In the study of railroads in this grade it is usually safe to stop with the nearest important railroad center located upon the line. In the study of roads it is usually safe to stop with the largest town to which the road leads.

(*i*) PUBLIC BUILDINGS. These include the school, churches, courthouse and any other large buildings within the locality studied. The reason for the existence of these buildings and their location can be profitably discussed. It is not well at this time to enter into their means of support.

(*j*) COURSE OF STUDY. Wherever the teacher finds an established course of study it should, as far as possible, be followed. If carefully prepared, such a course will cover the ground outlined above, and it will also prepare the pupils for the text-book to be used in the next grade.

(*k*) PREPARATION FOR THE TEXT-BOOK. In most schools the primary geography is introduced in the fourth grade. The teacher of the third grade should become thoroughly

THE *MINNESOTA*, A TRADING STEAMER
From a photograph.

acquainted with this book, and so plan her work that at the end of the year the pupils will be prepared to study the text-book intelligently.

7. Work for the Fourth Grade.—(*a*) INTRODUCING THE TEXT-BOOK. The failure of many teachers in geography begins at this point and is usually due to two things: (1) Lack of preparation on the part of the pupils, and (2) inability on the part of the teacher to handle the book wisely. In order that the second cause may be removed, the following suggestions are given:

(1) Let the teacher become thoroughly familiar with the primary geography before she begins her school. Her study of this book should be from the viewpoint of the teacher, not of the pupil. She probably knows the subject-matter that it contains, but in addition to this she should understand thoroughly the scope and purpose of the work.

(2) The teacher should note carefully the difficulties to be overcome, whether of fact, of language or of plan. Some books in primary geography are illogically arranged and their plan cannot be followed with success; some are written in language so difficult that the pupils cannot understand it, while others treat of topics far beyond the capacity of the pupils.

(3) The teacher should prepare the way to meet and overcome these difficulties.

(4) Careful attention should be given to the use of the book in the class. A new book is always an embarrassment to the young child, and when that book is so entirely different from any other with which he is acquainted as is the average primary geography, the trouble is great, indeed. The first lessons should be given to overcoming this embarrassment, and this can be accomplished the most easily by having the pupils use their books freely during the recitations, reading from the text and discussing with the teacher the facts presented in the lesson.

When the lesson to be assigned contains topics of more than average difficulty, it is often well for the teacher to spend a portion of the recitation in studying the lesson with the class and in helping them to understand the difficult portions. The teacher should remember that it is not so important that a given portion of the book be covered during the first few weeks of school as it is that the children should become thoroughly acquainted with the book, and in such a manner as to awaken their interest in it. After this is accomplished the work will progress rapidly.

(*b*) MAPS. With the introduction of the text-book comes a new phase of map study; that is, the study of the map in the book. If the text-book is carefully prepared, the first maps will be very simple. The teacher should see that the pupils understand what the maps represent. Attention should be called to the scale on which they are drawn, and the pupils should reproduce the maps as far as possible from memory either on the board or on paper.

Along with the study of the maps in the book, map sketching should be continued. The work of the third grade can here be extended to include larger areas, either of the country or the town, as the case may be. No effort should be spared to make the maps real to the pupil. They should mean more to him than a patch of blackboard or paper surrounded with lines. Because of the lack of proper training in the beginning of their study of geography, many pupils lose very much that is of value in the higher grades. If they once get a distaste for map study it seldom means anything of value to them afterwards.

The pupils of this grade should begin to model the surface of the country and continents which they study. In other words, they should be taught to make relief maps. Various materials can be used for this. Of these the most easily obtainable and least expensive is paper. Tear old newspapers into fine bits not to exceed a quarter of an inch square. Put these in water containing mucilage in proportion of about a tablespoonful of mucilage to a cup of water. Soak thoroughly and then grind in a mortar with a pestle or stir in a deep dish with a strong stick until the paper is transformed into a pulp. With this relief maps can be molded easily. The maps may be placed on bits of board or shingle, or if not to be preserved, on slates. The mucilage holds the paper in place and when dry the map becomes quite hard.

(*c*) ADDITIONAL MATERIAL. The fourth grade work in geography leads the pupil farther and farther from home. He has his attention called to new localities and he becomes interested in them and in new industries. This calls for more information from the book and from the teacher. Here is an opportunity to direct the pupils' reading to excellent advantage, if the class have access to a library. It is well for the teacher now to bring to class such material from her scrap cabinet as is suitable, and to have the different articles read to the class by pupils. She can often, also, call their attention to articles in papers and magazines, provided they are written in a style and in language that the children can understand.

The extending of these relations brings prominently before the pupils of this grade the subject of commerce, and this affords an excellent opportunity for a more complete study of types. The relation of the town to the nearest great city; the reason for hauling freight in different directions over the railway; the reason for different kinds of stores in town, such as groceries, drygoods stores, clothing stores, etc., should be clearly brought out. All of these lessons furnish excellent material for both oral and written language.

(*d*) IMAGINARY TRAVELS. A very interesting variation of the ordinary recitation in geography is occasionally to appoint different pupils in the class to take imaginary journeys, such as a trip from home to the nearest city, to a neighboring town, or, when the class is prepared for it, to a foreign country. The pupil prepares as thoroughly as possible and at the recitation gives an account of the journey, including a connected description of the place visited, and adds any other interesting facts possible. Sometimes pupils of the class have taken journeys to distant cities or some other locality. They are usually glad to tell the class what they have seen and what experiences they have had in going and returning. Whenever lessons of this kind are given, the teacher should see that the work is carefully planned and that the account is given in a connected manner and presented in good language.

(*e*) CURRENT EVENTS. Pupils of the fourth grade are interested in the affairs of their immediate locality. The teacher can turn this interest to good advantage, often using it to show the relation of geography to events, such as a washout in the road or railway caused by a heavy rainfall; or the necessity of constructing the roads in a certain way to avoid the effects of rain and snow. The pupils of this grade will be likewise interested in what happens in neighboring towns or cities with which they are somewhat acquainted; in discoveries and in descriptions of new things and new places. They are not interested in matters of legislation, either city or national, in court decisions or in financial topics.

The study of current events can be made profitable, provided it is duly guarded. Anything of a sensational nature—crimes, executions, scandals, politics or religious topics—should be strictly avoided, and only those topics introduced that can be discussed without objection on the part of any one and that will give valuable and helpful information.

The following outlines, in addition to those given in the lesson on *Nature Study*, are intended to be suggestive. Each teacher should select her topics and prepare her own outlines, adapting the lessons to the season, the environment and the pupils.

8. Suggestive Lessons for Primary Pupils.—(*a*) SNOW. Description; whence the snow comes; cause of snow; study of snow crystals; uses of snow.

A good time for this lesson is during the first snowstorm. As a preparation for the simple explanation of the cause of snow, the evaporation of water and its presence in the air may be shown by leaving a small dish of water in the room until the water evaporates.

(*b*) THE SUN. Have a simple description given by the class; call attention to the rising and setting, and the change in place of rising and setting as observed by the pupils. Give a simple explanation of the change of the sun's position. Have the pupils measure the sun's shadow each day at noon and draw conclusions. Discuss the value of the sun.

(*c*) OCCUPATIONS. Enumerate and describe various occupations according to the season; as, harvesting crops in autumn, cutting ice in winter and planting corn in spring.

9. Suggestive Lessons for Third Grade.—(*a*) MARKET GARDENING. 1. *Preparation.* Name the kinds of vegetables found in the markets and the places from which these vegetables come.

2. *Visit to a Market Garden.* Make a study of hotbeds; purpose, construction, location and use. Describe transplanting; also the care of fields. Explain the method of getting produce to the city.

In the discussion following this excursion, the teacher may show pictures of other market gardens, city streets where this produce is sold, wagon loads of vegetables being taken to the city and market gardens and workers in foreign countries where market gardening is carried on extensively.

(*b*) VISIT TO A CREAMERY. Make observations upon and have the recitation include the following topics: taking the milk to the creamery; weighing the milk; separating the cream from the milk; skimmed milk; churning; buttermilk; working the butter, salting; packing butter; the quantity of butter obtained from a certain quantity of milk; care of the creamery; milk inspection by officials. Compare this method of making butter with butter-making in private homes. Obtain pictures of various churns and separators, men weighing the milk, etc.

(*c*) FARMING. Have the pupils understand what a farm is. Observe various sizes of farms; kinds of soil; crops raised; care of fields. Study the work done in each season of the year; machinery, tools, buildings. What becomes of the produce? Discuss the importance of farming, and compare it with other occupations.

A visit to a near-by farm should be made if possible.

(*d*) FOODS. Meats, vegetables, fruits, nuts, etc.

Each of these topics should be taken up separately, somewhat in the following manner:

Fruits. Enumerate the various kinds familiar to the pupils; notice the place from which each comes and how it is brought to market; how it is produced; the industries involved in its production, and its value.

Every kind of fruit cannot be studied in detail; but one or two kinds should be studied as types, while the rest can be briefly mentioned. The study of food stuffs may be made intensely interesting by means of pictures, vivid descriptions and stories.

10. Bibliography.—Besides periodicals, three classes of books are valuable to the teacher of geography—books of travel, books suitable for the pupils to read and books on methods of teaching the subject. Those of the first and second classes are so numerous that no list of them is attempted, but a few of those most helpful to the teacher are here given:

Andrews, Jane, *Seven Little Sisters*, Ginn & Co., Chicago	$0.50
Andrews, Jane, *Ten Boys on the Road from Long Ago to Now*, Ginn & Co., Chicago	.50
Fairbanks, H. W., *Home Geography*, Educational Publishing Company, Chicago	.60
Frye, Alexander, *Child and Nature*, Ginn & Co., Chicago	.80
Geikie, Archibald, *The Science Primer*, American Book Company, Chicago	.35
Geikie, Archibald, *The Teaching of Geography*, American Book Company, Chicago	.60
King, Charles F., *Methods and Aids in Teaching Geography*, Lee & Shepard, Boston	1.60
Kipling, Rudyard, *The Jungle Book*, The Century Company, New York	1.50
Kirby, Mary and Elizabeth, *Aunt Martha's Corner Cupboard*, A. Flanagan Company, Chicago	.30
Redway, Jacques W., *The New Basis of Geography*, The Macmillan Company, Chicago	1.00
Rocheleau, W. F., *Great American Industries*, A. Flanagan Company, Chicago; Vol. I, Minerals	.50
Vol. II, Products of the Soil	.50
Vol. III, Manufactures	.50
Schwatka, Fredrick, *Little Children of the Cold*, Cassell & Co., New York	1.25

TEST QUESTIONS

1. What is the relative importance of geography in a course of study below the high school? Give your reasons for your answer.

2. In what respects does the teacher's preparation for teaching geography differ from that for teaching reading or language?

3. What is the relation of drawing to geography from the viewpoint of the teacher? from the viewpoint of the pupil?

4. Why does the teacher of geography in the primary grades need to read current periodicals?

5. Give an outline of a lesson for a class in the second grade, based on an excursion to a brook or creek.

6. Why is the study of types especially suited to the work in geography? What dangers must the teacher avoid in pursuing this line of work?

7. Give your opinion of the value of the study of maps in the third and fourth grades. What do you expect the pupils in each of these grades to gain from this study?

8. Why do so many pupils in the third and fourth grades dislike to study geography? How can this attitude towards the subject be changed?

9. Give an outline for a lesson in the fourth grade, based upon the study of Lake Superior as a type.

10. What relation does the geography work in the third and fourth grades bear to the language work in these grades?

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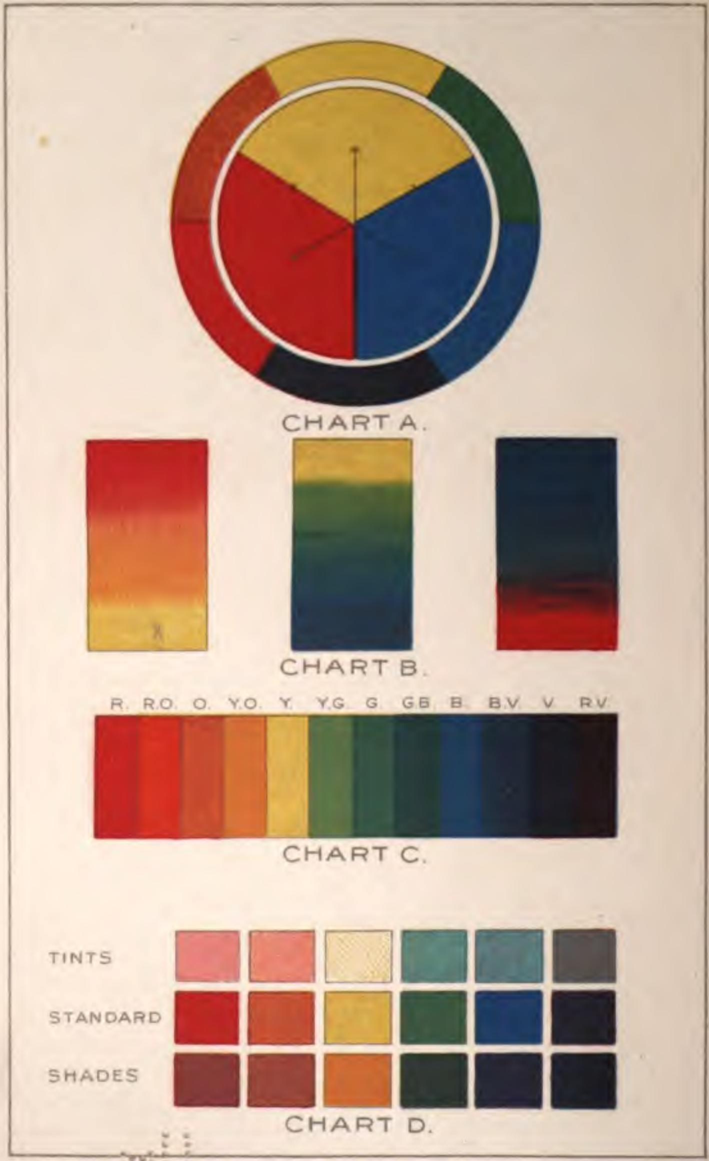


CHART A.
CHART B.
R. R.O. O. Y.O. Y. Y.G. G. G.B. B. B.V. V. R.V.
CHART C.
TINTS
STANDARD
SHADES
CHART D.

Plate VI

LESSON NINETEEN

DRAWING

I THE DRAWING LESSON

1. Drawing the Expression of Thought. [illegible] language of [illegible] every [illegible] [illegible] idea [illegible] [illegible] to observe [illegible] [illegible] pictures.

N[illegible] [illegible] thought [illegible] [illegible] form and crudely executed. Continued practice will, as time goes on, bring about a far better expression of thought and feeling.

2. Drawing an Inclusive Term.—The word *drawing*, as used in the school, covers a variety of methods of work. Not only does it include what is done with the pencil, but it covers also blackboard drawing, brush and ink work, color work and charcoal drawing. Cutting, modeling and construction work are allied activities whose purpose is the development of thought and expression, and these, too, are usually included in a drawing course, though they are not discussed in the present lesson. Elsewhere in the course they have received a certain amount of attention. (See Lesson Four, page 91.)

3. First Attempts.—As a general rule, children just beginning school have great faith in their ability to draw. They will attempt almost anything, and for the most part are quite satisfied with the results. There will be some, however, who feel that they cannot draw and who hesitate to attempt it. The latter are those that need the most aid. In the first place, their interest must be aroused in whatever is to be the subject of the drawing lesson and then they must be shown how to do the work. It is much better if the teacher is able to draw or sketch in all the different mediums used in her school, as pupils must be shown how to use brush, pencil and crayon. It is not well, however, to draw the same lesson or sketch which the pupil is expected to make. The teacher should make a similar picture that will show how the drawing is to be made, and then erase her own work and leave the child to his own problem. Spontaneous effort may be encouraged by arousing a lively interest in whatever is to be drawn or painted. If a cat or a rabbit is to be the subject, by all means bring one into the room where it can be watched and talked about for a few minutes.

Then, with no attempt to pose the animal, each child should be asked to make a sketch of it as he remembers it. The first attempts will be very crude, but no teacher should be discouraged by the results.

4. Pupils Need Encouragement.—Often teachers are too critical with the drawing of the little folks, and instead of calling attention to the good points, they make prominent the defects. Criticism should always be gentle and praise should be given wherever possible. Usually general talks or criticism relating to the subject as a whole, without mentioning of a particular drawing of a single individual, will accomplish all that is necessary. Many times the pupils should be allowed to study all the drawings and tell all the good points they see in the work of others. This cultivates keenness of observation and stimulates the pupils to greater effort to make artistic arrangements and to secure correct size and proportion.

Caution. It is never wise to allow a child to point out defects in the work of another, as it tends to cultivate an undesirable spirit of criticism and often results in wounded feelings or in anger. The spirit in which a drawing is made has much to do with its excellence.

5. Teachers Who Cannot Draw.—Such expressions as "I cannot draw and never could," and "I cannot draw even a straight line,"·are too common among teachers. Without exaggeration it may be said that in nine cases out of ten, instruction and practice are all that most teachers need to become reasonably skillful. The eyes of many have not been trained to see what they should see, nor have the muscles of the hand been trained to move in harmony with the idea in the mind. But if such teachers will get good books, study the principles involved in drawing and then draw, *draw*, DRAW, they will soon be surprised at their progress. Ten or fifteen minutes spent every night drawing on the board and as many spare moments at home spent in drawing upon paper will soon enable almost any teacher to give instruction in elementary drawing with success, providing the effort is coupled with a stern determination to succeed. Of course, lessons from some one who knows the principles of drawing are invaluable, but where personal instruction is impossible, books will furnish the method.

6. General Directions.—Following are a number of general suggestions for drawing and painting which should be carefully studied and utilized as they are needed in practice:

(*a*) MATERIALS AND HOW TO USE THEM. (1) *Paper.* The best paper for drawing is a cheap manila which takes a soft pencil, water color or crayon easily. Its soft, yellow tone harmonizes with color much better than a dead white. Such paper may be secured at very small cost from booksellers or dealers in supplies.

(2) *Pencil.* A special drawing pencil should be used, such, for instance, as the Prang (S. M.) school pencil and Kohinoor (3B). The drawing pencils should be used for no other work and should be collected after every lesson and kept safely till the next drawing period. (See Note, Lesson Nine, p. 226.) The point should be kept blunt, in order to produce that soft, broad gray line which is so desirable. The pencil should be held lightly three or four inches from the point. (See A and B, Figure 1.) In drawing straight lines the pencil should be held at right angles to the line to be drawn. Vertical lines should be drawn from top to bottom, horizontal lines from left to right, and oblique lines from top to bottom, as a rule. (See Figure 2.) In drawing circles the pencil should move from left to right, beginning at the bottom, moving toward the left and coming around by the right to the bottom again (Figure 3). In drawing an ellipse the pencil is held at right angles to the long diameter and moves in the same direction as in drawing a circle (Fig. 4).

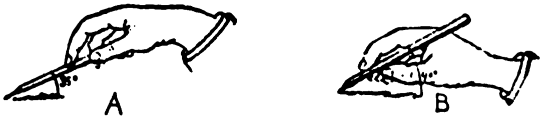


Fig. 1

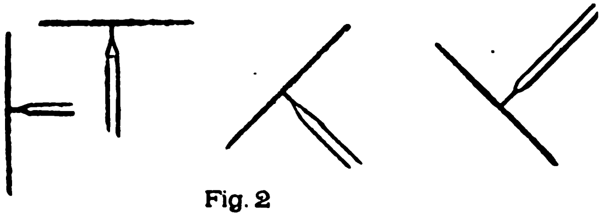


Fig. 2

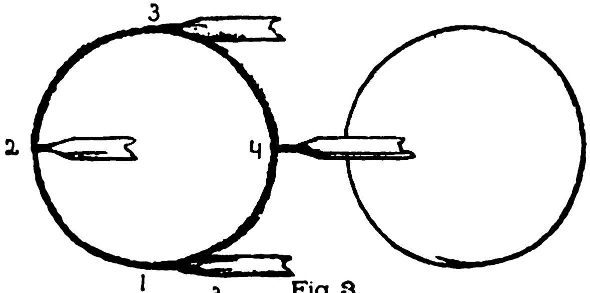


Fig. 3

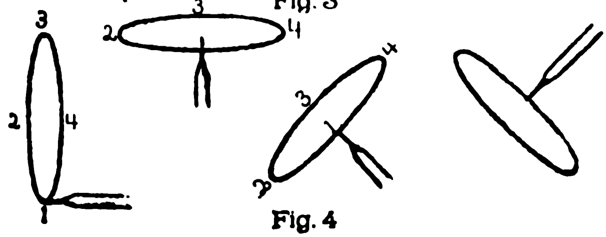


Fig. 4

POSITIONS FOR THE PENCIL

(3) *Brush and Ink.* The materials needed consist of ink, rice paper or common drawing paper and a small camel's hair brush. Drawing ink, while more expensive, is preferable to common ink, as it is much blacker. A strong wash of lampblack water color may be substituted for the ink. Rice paper is quite thin and transparent, and for decorative work may be laid over a former pencil sketch and so painted in more accurately. The drawings are made in black, black and white as in a landscape, or in black and grays. The grays may be produced by mixing water with a small portion of the ink.

(4) *Water Colors.* The materials needed for water color work are water color paper or manila paper, a box of water colors, a camel's hair brush, No. 7 or 8, an old cloth or piece of blotting paper to take up superfluous color, and a small glass or dish to hold water. A box of good water colors may be purchased for from fifteen to twenty-five cents. It contains one or two brushes and three colors, red, blue and yellow, which may be combined to form other colors. The Prang water color set No. 1 is among the best.

If possible, the teacher should order these boxes of water colors herself, as too often the pupils purchase boxes which contain ten or twelve cakes of different colors which prove to be absolutely worthless.

A *wash* is water tinted with a color and laid evenly over the surface of the paper by means of a brush. The paper should be fastened to a smooth board by thumb tacks at each corner. This prevents the paper from curling up and saves it from being soiled by the fingers of the pupils who try to make it lie flat. The wash is made by dipping the brush into the clear water and conveying it to one of the little compartments in the cover of the water color box, where the water is squeezed out by pressing the brush against the tin. This is repeated until there is enough water for the wash. It is necessary that enough should be made in the first instance to cover the entire surface, as it will be difficult to mix more to match before the first color has dried. From one of the cakes of paint as much color as is desired is rubbed off and mixed with the water. When applying the wash to the paper, the latter must be held at an angle of about twenty degrees and not allowed to lie flat.

Dip the brush in the wash, remembering that the brush should always be kept full. Begin at the upper left-hand corner, move the brush clear across the paper to the right; then drag this color downward by short quick strokes until the entire surface is covered. The superfluous paint left at the edges and bottom of the paper may be taken up by drying the brush with an piece of old cloth or a piece of blotting paper and then applying the brush to the paper.

A graded wash is a wash that varies from light to dark or dark to light. It is put on by beginning with the full strength of the color, and as the brush moves downward adding water until only clear water is left at the bottom, or by beginning with clear water and adding color gradually.

Caution. Avoid going over the same place twice. Children, unless taught better, rub the brush back and forth or in any direction that suits them until the water is used up. The movement should be in a certain direction and the brush should be kept full of water.

(5) *Crayons.* Colored crayons are often used for color work, but are not as satisfactory as the water colors. They can be bought in small boxes which contain six assorted colors.

Caution. The crayons should be held lightly, to avoid rubbing them into the paper, or a muddy effect will be produced.

(6) *Charcoal.* Charcoal is a very good medium for all black and white drawings, and should be handled as the crayons are.

(*b*) Position. Pupils should sit facing the desk, with their feet flat on the floor. The eyes should be no nearer to the paper than is necessary for a clear view. Avoid stooping and hunching of the shoulders. In drawing on the blackboard, pupils should stand an arm's length from it. (See Movement.)

(*c*) Movement. Owing to the fact that the muscles of the hand and arm are untrained when pupils enter school, considerable work at the blackboard is helpful. Freedom of movement rather than accuracy is to be sought, and to secure this end whole arm movement should be insisted upon. Pupils must not be allowed to hold the chalk tightly with cramped fingers and to draw with fingers and hand merely; the whole arm must come into play. To assist in securing this freedom of movement the pupils should be encouraged to draw immense circles over and over again. These may be called birds' nests or whatever the imagination suggests. Other movement exercises should be employed. Two straight lines pointed Λ may be called a soldier's tent; a row of vertical lines, soldiers marching; horizontal lines crossed by vertical lines, a fence; a curved line, a bow.

Trees may be easily drawn in mass; they should not be outlined. Using the side instead of the end of the chalk, the foliage may be represented, not in detail, but in mass; with two strokes of the chalk downward, using the side of the crayon, the trunk is made. By bearing a little more heavily on the chalk, one side of the trunk may be shown in shadow. Teachers should draw from the class the fact that the tree trunk is broader at the base than above. A great many simple drawings of this nature will help to secure freedom of movement.

In drawing at the board, short pieces of chalk should be used. To secure broad lines, these should be held hori-

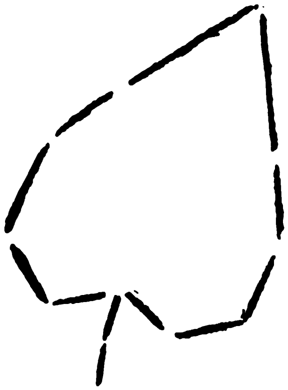


Fig. 1

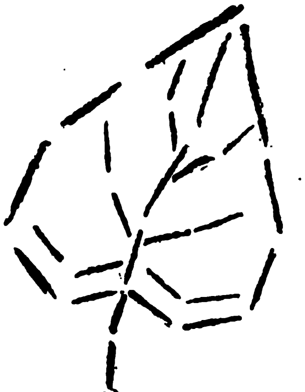


Fig. 2

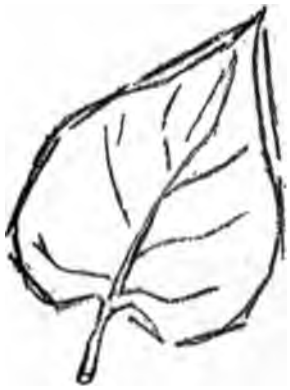


Fig. 3

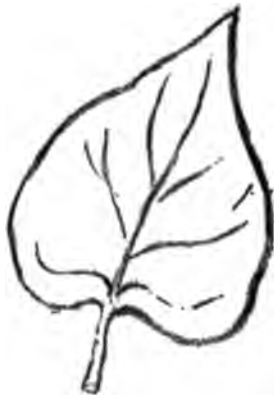


Fig. 4

BLOCKING-IN

zontally. From the beginning the pupils should be taught to do without erasers. Little is accomplished where erasers are used constantly, for the pupils draw without thinking and then erase. If they are deprived of the erasers they will think before drawing. When it is necessary to use erasers, the movement should be downward, as this causes the chalk dust to fall into the till instead of being thrown into the air of the room. (See page 10, caution 2.)

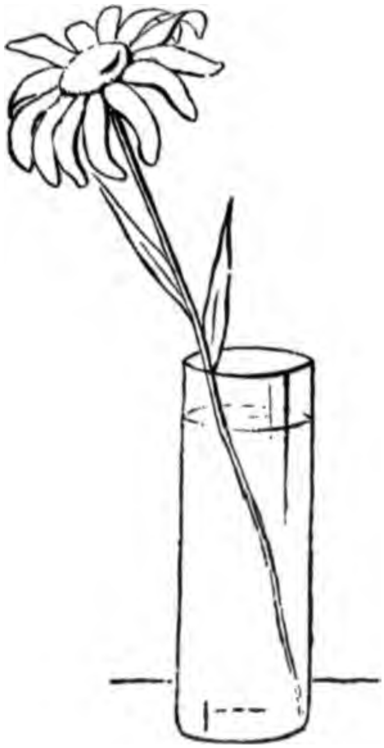
Caution. Do not let the time at the board exceed ten minutes. Children tire quickly and their work soon becomes spiritless and of little value.

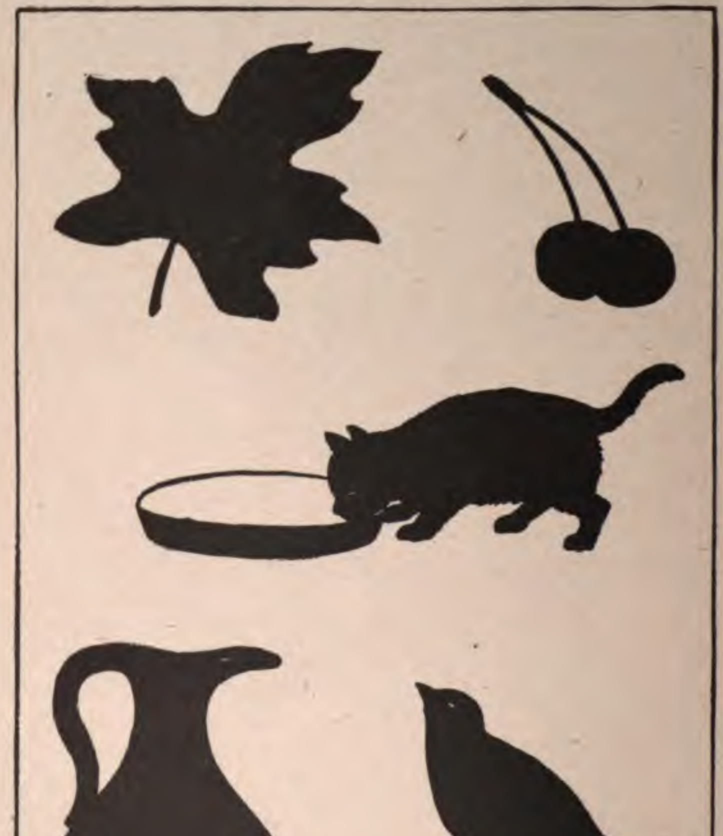
(*d*) BLOCKING IN. Blocking in is the process by which the outlines of mass are indicated. Details are not shown. The result is a crude drawing which shows size, proportion and position only. In the illustrations of blocking in a leaf (Page 523), Figure 1 shows the bare outline; in Figure 2 the positions of the midrib and veins are indicated. Notice that straight lines are used for this purpose. In Figure 3 curved lines representing the shape of the leaf are drawn, while Figure 4 shows the leaf with the blocking in lines erased.

(*e*) ACCENTING. The difference in the distance of objects or parts of objects may be shown by making some lines darker than others; in other words, by *accenting*. The lines which are nearest and most important should be accented, while the lines farthest away or not so important should be kept light. Children are inclined to use the same sort of line throughout, but may be readily taught simple accenting. (See Page 525.)

(*f*) CARE OF MATERIALS. From the very beginning the pupils should be taught to take good care of their materials. Paint-boxes should be cleaned after every lesson, brushes washed and brought to a point by a vigorous shake, and paint-cloths washed. Time may be saved by appointing one child to wash these cloths—a service willingly rendered if the appointment is made in the right spirit.

7. Brush and Ink Work.—The value of brush and ink work lies in the fact that it teaches the pupils to see mass without the detail. In order that the pupil may see the general shape rather than details, the objects chosen for representation should be such as present a strongly marked outline. Trees, leaves, dishes, grasses, spears of flowers, animals and fruits are but a few of the numerous things which may be suggested. Often the black lines are made





BRUSH AND INK PAINTINGS

with the pen rather than with a brush. Pupils will enjoy the work because of the striking results produced, if for no other reason. Brush and ink work is illustrated by the drawings on pages 526 and 546.

Caution. Teach the pupils to work from the first with the brush and not to draw the object or landscape first in pencil. If it ever seems necessary to make the pencil drawing first, use light blocking in lines as few in number as possible.

8. Pencil Painting.—The results obtained by using both color and black and white in the drawing course are much better than those that result from the use of black and white exclusively. Color sense needs development as well as the other senses, and interest in the exercises will be immeasurably greater if color can be used. Accordingly, this lesson has been planned with the idea that the teacher will use both color and black and white as occasion demands. But where it is impossible to use color, the teacher should not be discouraged, for much may be accomplished with pencil work alone.

Nearly all of the illustrations given here may be executed in pencil, the colors being indicated by light and dark shading. In order to determine which are the light and which the dark values, it will be found helpful to look at the object to be drawn with the eyes partly closed, thus shutting out all detail and leaving visible only the large mass effects. In order to make soft, broad lines to cover the entire surface, the pencil must be held under the hand—that is, with the unsharpened end pointing toward the palm of the hand. Such work is sometimes called *pencil painting*, or mass drawing. The accented line may be made with the pencil held in the ordinary way, between the thumb and first finger. It should be remembered that in pencil drawing the tendency is to lay too much stress on the mere outline.

Practice in pencil painting, in which no outline is required, will overcome this difficulty.

9. Color Study.—Before attempting to give instruction in water colors, the teacher should make a careful study of color. The colors of nature are found widely scattered, but an orderly arrangement has been given us in the rainbow or *solar spectrum*. By means of a glass prism held in the sunlight, the colors of the *solar spectrum* may be thrown upon a white background, where they can be studied at leisure by teacher or class. The six standard colors, red, orange, yellow, green, blue and violet, may be examined in the color charts (Plate VI). From the study of the *solar spectrum* it has been found that all colors are the results of combining red, yellow and blue in various proportions. For this reason, red, yellow and blue are called the *primary colors* (see Chart A, Plate VI). In Chart B the three *primary colors* are blended together in pairs to show how they mix to form intermediate colors. Red and yellow mixed in equal proportions make standard orange; blue and yellow mixed in equal proportions make standard green, and red and blue mixed in equal proportions make standard violet. Orange, green and violet are therefore *secondary colors*. By varying the proportions of red and yellow we have (Chart C) red orange (R. O.) and yellow orange (Y. O.) respectively; by varying the proportions of yellow and blue we have yellow green (Y. G.) and blue green (B. G.) respectively; by varying the proportions of blue and red we have blue violet (B. V.) and red violet (R. V.) respectively. Red orange, yellow orange, yellow green, blue green, blue violet and red violet are the *tertiary colors*.

Complementary colors are those which are most unlike each other. When the spectrum is arranged in a circle, the colors directly opposite are complementary to each other, that is, red and green, orange and blue and yellow and violet are complements each to the other respectively. The arrows in Chart A point to complementary colors. If a person will look for a few moments steadily at one color, red for instance, and then rest his eyes quickly on a plain white surface, he will see a patch of the complementary color, green.

Tints and shades are colors darker and lighter than the standard colors. Colors of a lighter value are called tints, while those of a darker value are called shades (see Chart D). Where water colors are used by the painter, a tint may be obtained by adding water to the standard color and a shade by adding more paint to the standard color. In nature we find very few colors as bright as those in Chart C. Most of the colors have been *grayed*, as the artist says. To gray a color, some of its complementary color is mixed with it.

Before they have completed the third grade, children should have become familiar with twelve colors; namely, red, red orange, orange, yellow orange, yellow, yellow green, green, blue green, blue, blue violet, violet and red violet. Color sense, the power to recognize different colors, should be developed before the color name is learned, for the name without the idea is valueless. For the purpose of developing the color sense, pupils may be requested to match certain colors. The teacher does not name the color, but hands the pupil a piece of red worsted or red paper, for instance, and asks a pupil to pick out others of the same color. When the pupils are able to match colors, the color chart may be reproduced by means of colored crayons.[1] In forming the spectrum thus, the names of the colors are still unnecessary. In fact, the names should be taught last of all. Color relation, as the relation of orange to yellow orange, may be brought out after the standard colors are readily recognized. While learning the names of the colors by means of the chart or colored object, the pupils may begin to express color by means of paint. By experimenting with the three colors in their boxes they readily learn that red and yellow make orange, blue and yellow make green, and red and blue make violet.

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[1] Papers colored in all the primary, secondary and tertiary colors with their numerous tints can be obtained from kindergarten supply firms and with these the teacher can make a very satisfactory color chart at little expense. These papers also afford excellent material for designs.

10. Washing and Blending.—For the first wash, vertical oblongs of paper may be colored, or simple geometrical figures cut out or outlined on paper may be used as subjects. Stencils through which patterns or designs may be made upon paper can be purchased. These, of course, can be used many times and are economical, especially if the teacher is pressed for time in making the designs. Simple landscape pictures may also be blocked in and these make excellent patterns.

To give variety to this elementary work, several different washes may be combined in the following way: First, cover the whole design by a single wash. When this is dry, apply a second wash stronger than the first over part of the design; later lay a third wash stronger than the second over the design, thus producing three different shades of the same color. In the same way washes of different colors may be combined. A simple landscape is produced by a wash of one color for sky and another for ground. This may be elaborated by adding a mass representing hills or a line of trees or bushes placed where the sky line meets the earth. Each step should be thoroughly mastered before taking the next; that is, the sky and the ground should be perfected before the trees or hills are inserted. (See Plate IV.)

When washes are applied to dry paper, the colors do not run together but remain sharply distinct. If, before putting on the color, the whole paper is covered with clear water and the colors applied before the paper is entirely dry, they will blend, giving a more natural effect. This is often done to make the background of a picture. When the paper is nearly dry, details may be added or water or light places in clouds may be shown by taking up the color with a dry brush or by soaking it up with a cloth or sponge.

Stained glass window effects may be obtained by going over the whole of the surface to be covered, with a wash of clear water and, while it is still quite wet, rubbing the brush on the cake of color and touching it to the wet surface just enough so that the color will spread out of its own accord. When this color has been carefully cleaned off the brush, a second may be put on in the same manner, after which others may be added, allowing all to blend as they will. The children will be very much interested in this, and the teacher will find in the windows a good way to interest the children in geometric forms, because the window panes may be made of various shapes combined in many designs. (See Plate III.)

11. Choice of Subjects.—(*a*) INTERESTING SUBJECTS. Upon the proper choice of subjects depends much of the teacher's success in the drawing class. It is manifestly absurd to give a little beginner a cube and tell him to draw it. He neither knows what a cube is nor feels any interest in it; but when the cube means something to him, or receives interest from its connection with something else known to him, as a box, a chicken coop or a doll house, he becomes anxious to draw it. Meaningless drawings are of no value, even though the children continue to make them. One takes little interest in drawing a circle just because it is a circle; if it means an orange, a ball, an apple or a bird's nest, it possesses a genuine interest, and drawing it has a meaning; it becomes the expression of an idea. Copying pictures has little value. The drawings should be original to bring out the thought of the little worker.

(*b*) SEASONABLE SUBJECTS. If the drawing lessons are made to harmonize with the seasons and festivals of the year, there is a spontaneous gain in interest. For instance, in the fall the work may well be with fruits, nuts or vegetables; autumn leaves, grasses and weeds; autumn landscapes and trees, and the games usually played by the children at that time of the year. Thanksgiving Day may be illustrated from stories about the day and by using turkeys, ducks and pumpkins for objects in decorative drawings for menu cards. At Christmas time holly, evergreens, Christmas trees and toys are good subjects. On our national holidays the subjects for drawing lessons may be patriotic in nature—marching men or children, and flags. Valentines, Easter cards and calendars all come into play in their respective seasons. The other branches of study are constantly suggesting subjects which should be utilized at the proper time, and so the drawing lesson is correlated naturally with the other recitations.

(*c*) OBJECTS. The plainest and simplest objects are best suited for primary drawing (see page 533), for simple objects, especially if they possess meaning, encourage the children to increase their efforts in expression. Objects with a great deal of decoration and those complicated in form are to be avoided, except with the more advanced students. If objects are to be used as the basis of color work, it should be seen that they possess a strong, decided color. Especially is this true in the early work. Let the teacher take the greatest care in selecting the objects, always adapting the choice to the age, capacity and intelligence of the pupil. By remembering this precept, much time will be saved and many a discouraging hour avoided.

The study of geometric forms may be begun in the first grade. Such forms as the circle, oval, ellipse, cylinder, square, rectangle and triangle are readily understood by

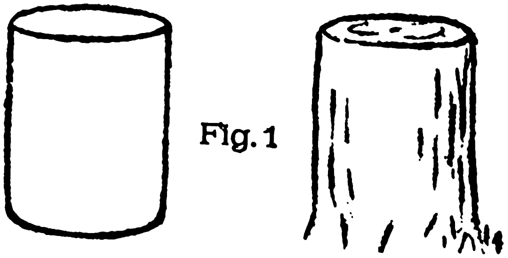


Fig. 1

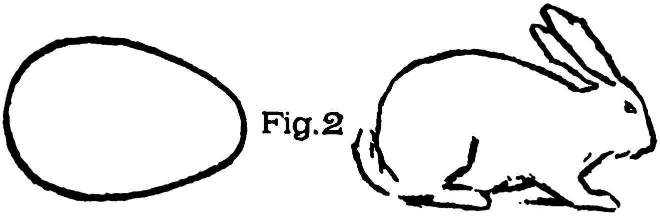


Fig. 2

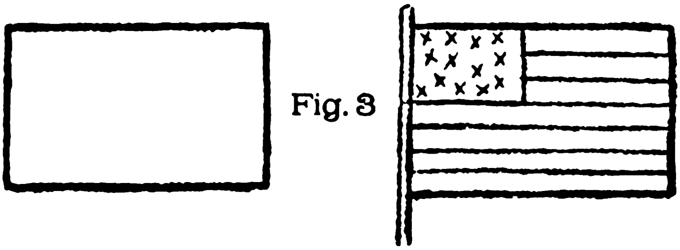


Fig. 3

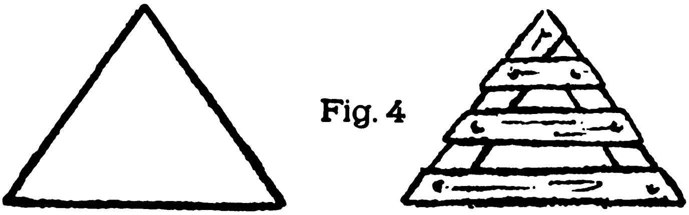


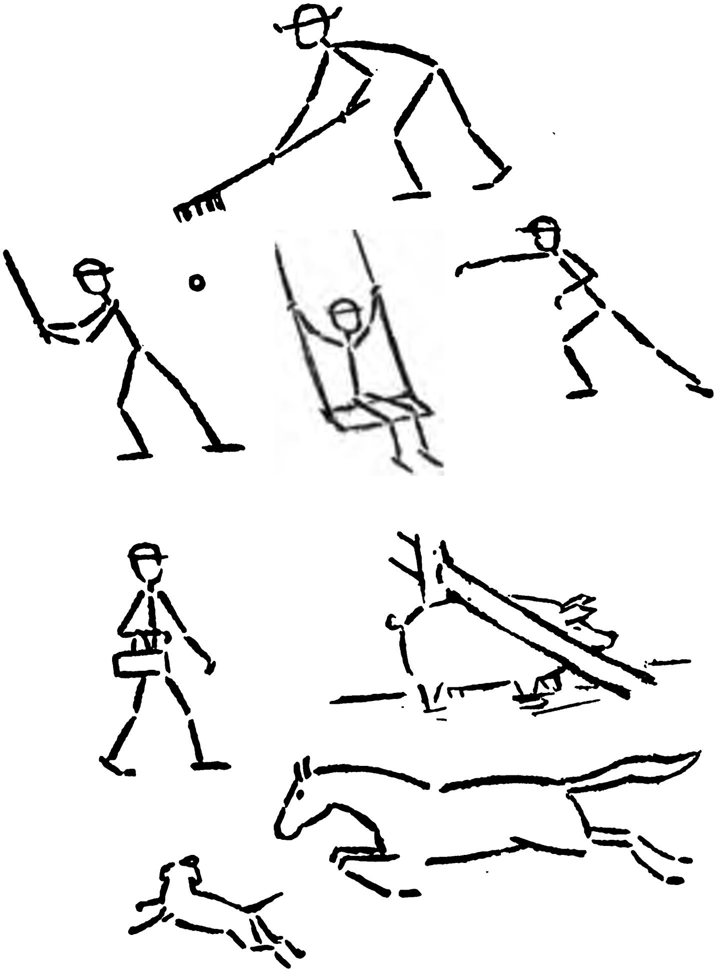
Fig. 4

GEOMETRICAL FORMS AND THEIR TRANSFORMATION children in the lower grades and prove of great assistance in drawing. The forms may be taught by means of figures cut from cardboard or paper. To familiarize pupils with these various forms, they should be asked to pick out such objects of similar form as they can find anywhere in the room, or to mention what they can think of. In the drawing of these forms they may be made to represent the objects which the children have discovered, as a square may become the side of a shed; a rectangle, a flag; a triangle, an end view of a roof; an oval, the body of some animal; a cylinder, a tree trunk, as shown in Figures 1 to 4 on page 533.

(*d*) PLANT LIFE. Flowers, simple grasses and weeds afford an endless number of interesting subjects. They may be executed first in black and white with pencil, charcoal, or brush and ink. The work in the beginning should be in mass rather than in detail. Trees should be drawn in mass and the children should familiarize themselves with shape and character, so that without seeing the leaves they will know what kind of a tree is represented. (See page 546.)

Caution. Always work for the character of the subject, that is, to show whether it is light, airy and dainty, with gracefully curved stems, or strong, straight and sturdy.

(*e*) LANDSCAPES. Bits of landscape make especially pleasing pictures in color and may be easily made to show the differences in the weather: the sunshiny day in summer, with a clear, light blue sky and soft, green grass; the rainy day, with clouds and a gray mist prevailing over the whole picture; windy days, shown by the way the branches of the trees are blown to one side; sunset or evening landscapes, showing more vivid colors by red, pink and yellow in the sky, and the dull, dark green grass and trees. In a similar way the different seasons of the year may be shown by the difference in color of the trees and the grass or ground. (See Plates I and IV.)



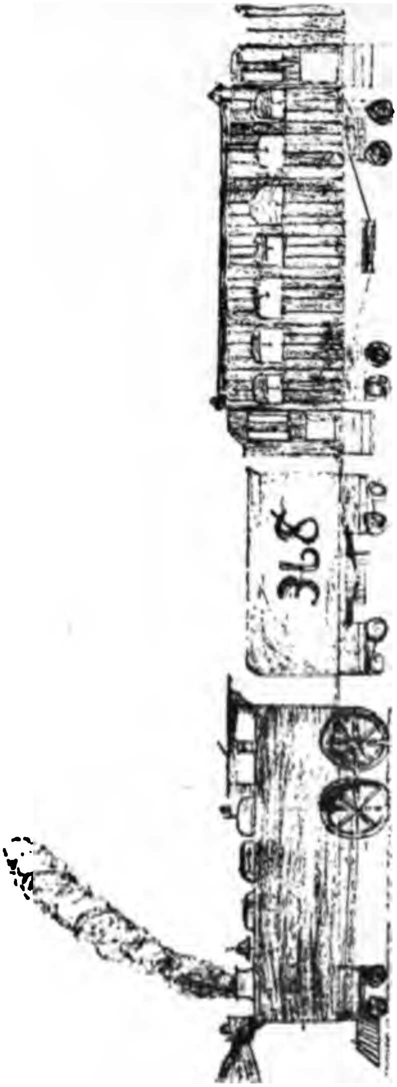
ACTION SKETCHES FROM MEMORY.

(*f*) FIGURES. Let one of the pupils assume a pose or perform some simple act, such as walking or running across the floor; catching or tossing a ball; pouring water from one vessel into another; dusting or sweeping. Require the other pupils to observe and then make quick memory sketches, using simple, straight lines as shown on page 535, or drawing in mass. The line drawings are made with a pencil, but the mass drawings can be made either in pencil or charcoal or in one tone of water color. It must be expected that these sketches will be rough and crude, but they will teach close observation and cause the children to work in a larger and more direct way that will be exceedingly helpful to them later. Moreover, the children enjoy these exercises, and once sufficient interest is aroused they will not hesitate to attempt to make a sketch. Later they can draw more accurately from a fixed pose.

(*g*) ILLUSTRATION OF STORIES, VERSES, ETC. Drawing from imagination should form a large part of the pupil's work. In object-drawing the work is done with the actual subject present to aid the children. In drawing from imagination, the little artist draws in accordance with the image he himself pictures, relying upon memory for size, shape, color, etc. That both methods of drawing should be practiced is evident, for the object-drawing perfects the imaginary, and the imaginary drawing causes closer observation of the object. In illustrating or drawing from imagination, the pupil may combine objects in new relations, new positions or new environments, but he relies upon his memory of the actual things seen at one time or another. Object-drawing teaches form, size, color and construction; imaginative drawing develops the child's ingenuity and power of expression.

As an illustration of what may be expected from children, a few pictures are given exactly as they were made by them except that the pictures have been reduced in size about one-half. This reduction has made the lines a little more vivid, but has not destroyed the character of the work. The three children who have contributed their drawings have been in school and have had some little instruction in drawing, though no one is beyond the third grade. The natural taste of each shows conspicuously.

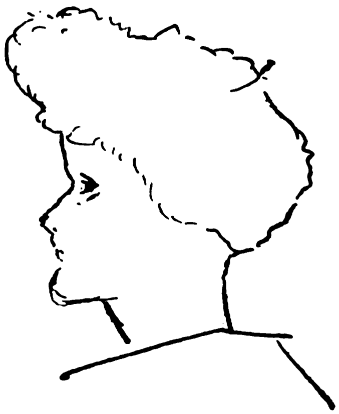
Allison was asked to draw a picture—anything he wanted to draw—and the result is the engine, tender and car. His father was an inventor and Allison's tastes, like those of many boys, run toward mechanical objects. It is fair to say that Allison lives not far from the railroad and sees many trains every day. The smoke has attracted



ALLISON'S PICTURE

his attention, and he has made it a notable feature of his drawing.

When the same request was made of Wyatt, he drew this head, rather skillfully blocking it in. It is evident that Wyatt is a different boy and interested in different things. Both boys express themselves. It would be unfair to criticize the drawings from the same point of view, or to discourage either by comparing his work with that of the other.



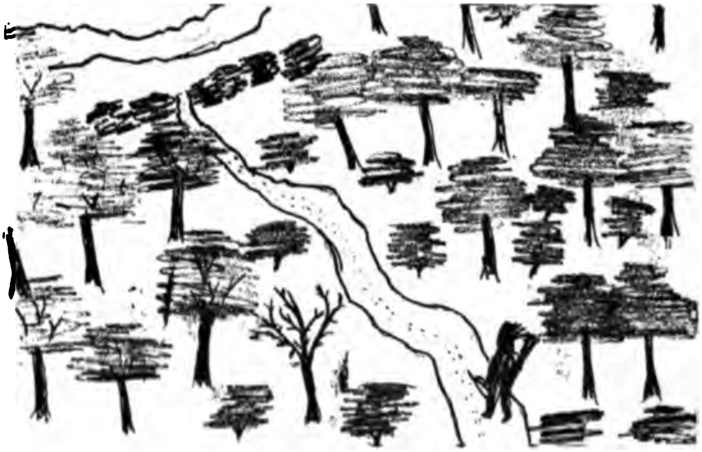
WYATT'S DRAWING

Harry was given that portion of *Hiawatha* which begins with the following words:

> "Then the little Hiawatha
> Learned of every bird its language."

He was asked to make four pictures to illustrate the story. He had not read the story previously, nor did he have any instruction in the drawing, except as noted. His first drawing, which is not reproduced because of its similarity to others, illustrated the lines:

> "Forth into the forest straightway
> All alone walked Hiawatha
> Proudly, with his bow and arrows;
> And the birds sang round him, o'er him,
> 'Do not shoot us, Hiawatha!'"



HARRY'S SECOND PICTURE

The second picture is reproduced. It is for the lines:

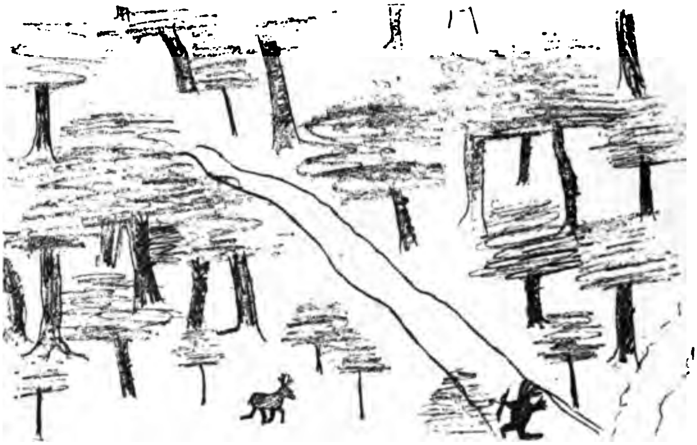
> "But he heeded not, nor heard them;
> For his thoughts were with the red deer;
> On their tracks his eyes were fastened,
> Leading downward to the river,
> To the ford across the river."

It will be seen that Harry has some idea of perspective. He was very much interested in the tracks of the deer.

His third picture was for the lines:

"Then, upon one knee uprising
Hiawatha aimed an arrow."

These three pictures are bird's-eye views and the trees are the shade trees of a city street, far apart, with rounded tops like the maples he has always seen. After he had drawn the third, he was told that in the woods the trees were very close together and that a person on the ground would see very little excepting the trunks of the trees. So he drew his fourth picture to illustrate the lines:



HARRY'S THIRD PICTURE

"But the heart of Hiawatha
Throbbed and shouted and exulted,
As he bore the red deer homeward,
And Iagoo and Nokomis
Hailed his coming with applauses."

A few topics and verses suitable for illustration are given on page 560.

12. Placing or Posing the Object.—For object-drawing, separate subjects should be arranged in alternate aisles upon boards resting on the front desks. There should always be a background or shadow box to shut out other objects. This may be formed by sewing or pasting two pieces of cardboard together so they stand at right angles forming a shadow box, or by using two sides of an ordinary soap box with a piece of tinted cloth or paper laid over it.

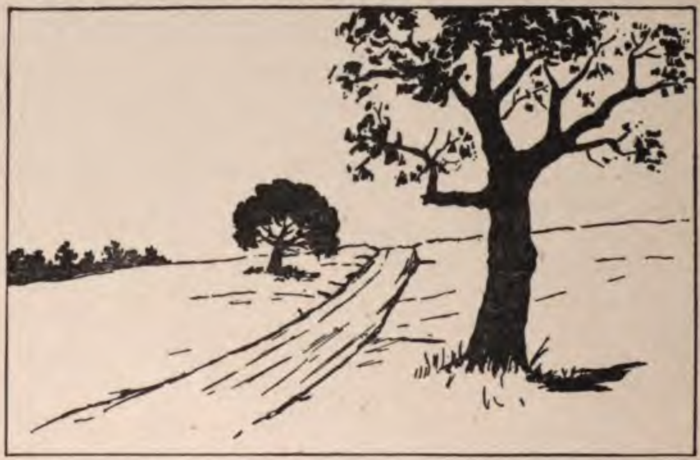
HARRY'S FOURTH PICTURE

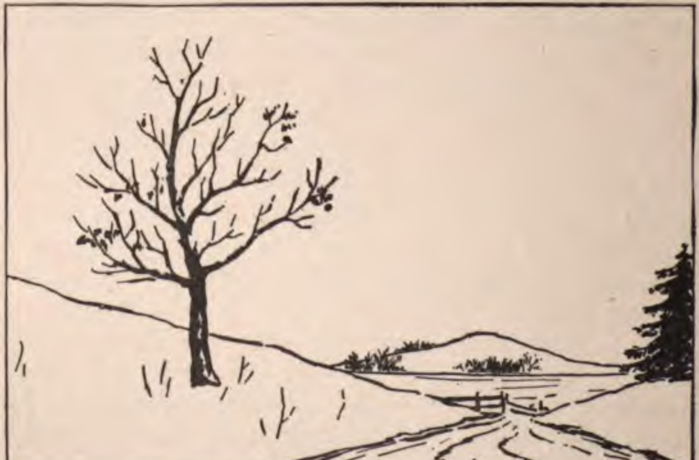
Caution. 1. When two or more objects are to be put into one composition, care must be taken that they harmonize in color.

2. Contrasting shapes or forms make more pleasing compositions than those very similar.

3. Avoid placing the objects in a line. Have one a little in front of the other.

13. Important Points to Be Considered.—(*a*) COMPOSITION. By composition is meant the placing or arrangement of objects. For pupils beyond the first grade a ***finder*** is





LANDSCAPE COMPOSITION

helpful. This consists of a piece of paper with a small rectangular opening cut out so that when one holds the finder three or four inches from the eye and looks through the opening, the finder forms a boundary or margin corresponding to that of the picture. This finder can be moved about till the most pleasing arrangement is found.

In the composition of landscapes, avoid an arrangement that directs the eye out of the picture, or one where the most interesting objects are cut in two, as in the second drawing on page 542. In this drawing, if the marginal line had been moved to the right a quarter of an inch, and the whole of the pine tree brought within the picture, the result would be much more pleasing. Objects of less importance may be cut by the marginal line without spoiling the composition. In the first drawing on the same page, the top of the large tree is cut off, but the main part or weight of the tree is there, so that we do not feel the lack of balance as we do in the other drawing. A study of the illustrations in books and magazines will help to make this point clear.

(*b*) SIZE AND PROPORTION. The study of the relative size of objects is an important part of primary drawing, but it is liable to be neglected. That children need drill on this subject, any one who examines the drawings of beginners will readily see. In their first drawings, men are made as tall as houses, arms are longer than legs, birds and men are the same size, the bird's head is absurdly large for its body, or its legs are abnormally long.

A few lessons in comparing objects will remedy these defects. It is a good plan to begin with very simple objects, as marbles, oranges, tops and balls. Whenever it is possible, have the actual objects before the class. Use one, say the orange, for the unit of comparison, and study the size of each object with reference to the size of the orange. Let the pupils draw an orange on the board, then draw each of the other objects beside it, showing the relative size. Take the class out of doors and let them compare the height of a tree with that of a man; the size of a building with the size of a dog; the height of grass with that of a bush. Constantly compare other objects in order to keep the idea of relative size before the pupil's mind. Size and proportion can best be discussed in the talks or criticisms when the exercises of the whole class are up for comparison.

Pencil Test. To aid the pupils in getting correct proportion, the pencil test should be used. Just as in the case cf teaching blocking-in, the best way to show how to make the pencil test is for the teacher to use it repeatedly. The pencil should be held at arm's length, with the unsharpened end pointing upward. It should be held in such a way that the top of the pencil is on a line with the highest point of the object whose proportion is being studied. With the thumb nail, mark off on the pencil the lowest point of the object. Next, hold the pencil horizontally, making the end cover the left point of the object. See where the right point of the object falls on the pencil and compare the width with the height. For instance, the object seems one-half as wide as it is high, or one-third or one-sixth as wide. Show this proportion in your drawing, but never transfer the actual measurements on the pencil to the paper. It is merely the proportion that is to be shown. In getting the proportion of an object wider in one place than in another, as perhaps a vase, measure at the place of greatest width.

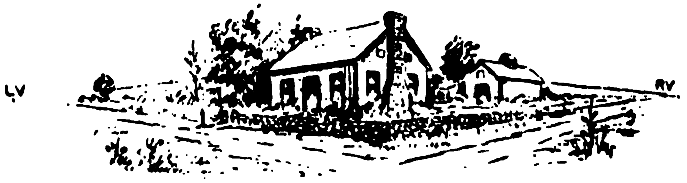
(c) PERSPECTIVE. In connection with the study of the relative size of objects, the pupils may be taught a simple principle of perspective; that is, how to show objects at different distances away from the observer. The simplest way to teach this is to take the pupils where they can see a long line of telegraph poles or trees flanking a road. They may be led to observe that the farther away the poles are, the shorter they appear. Another method is by comparing, by means of the pencil test, the height of a pupil or desk that is near, with that of one at the other side of the room. The same facts may be observed of trees or any other objects. To test the pupil's grasp of this principle of perspective, the teacher may draw on the board the first and last poles of the line, asking the children to put in the one in the middle or the one next to the last or all of the intervening poles. Light lines sketched from the top and bottom of the first pole to the top and bottom of the last respectively, will be of great assistance in the first lessons. Where there is a row of telegraph poles on each side of the road, the teacher may point out the fact that as the lines recede from the eye, they appear to converge or draw nearer together. The same principle of convergence is vividly illustrated by a railway; as we stand on the track and look along it, the rails seem to come together in the shape of a V.

In the accompanying sketch, the bottom one on page 546, three different problems in perspective are shown, but for little children not more than one should be attempted in one lesson. For instance, the trees at the left of the picture form one problem. All these trees are the same height, yet in the distance they appear much smaller. The fence posts and telegraph poles form a second problem. Although the posts and poles are equally distant one from another, yet in the distance they not only appear smaller, but closer together. The third problem is a man in the immediate foreground and a load of hay in the distance. We know that the load of hay is actually many times larger than the man, but if we wish to make a picture representing the load of hay to be some distance from us, we must draw it much smaller than the man.

Notice how all the lines seem to come together at a single point. If straight lines were drawn from the top and bot-

tom of any of the objects in the foreground to this single point in the distance, they would show the relative height of the same object, or of another object of equal height at any intervening point in the distance. The point at which all these lines seem to meet is called the *vanishing point.*

When a person stands so that he sees the angle, or two sides of a house, box or any object whose sides form an angle, he will have two vanishing points, one for the lines of each side of the angle.



The picture shown above is an example of angular perspective. RV marks the *right vanishing point;* LV the *left vanishing point.*

For second grade work the following exercise for the study of position or perspective of a group of objects not on the same horizontal line may be found helpful: Secure a number of simple objects and arrange them upon a table. Number them. Ask the pupils to pick out the object directly back of number one; at the left of number one; at the right of number one; at the right of number two; back of number two. Ask some child to place the objects in the same horizontal line; to place one behind another, one at the right of another, etc. Step to the board and draw two objects in the same horizontal line, asking the children to arrange them as you have drawn them; draw the objects in various positions, each time having the objects on the table placed the same way. Finally, let the pupils draw as you arrange the objects. Bring out the fact that if the group is below the level of the eye, the farther away the object is, the higher it must be drawn on the board or paper, and the nearer it is, the lower on the paper; also the fact that when one object is in such a position that we cannot see all of it, only the part we see is to be drawn. Do not forget the fact that the farther away the object is, the smaller it must be drawn.

(*d*) RELATIVE VALUES. Relative values or comparison of colors, or light and dark, should be determined before beginning the drawing. That is, pick out which is the darkest part of the picture, and show this by the darkest or heaviest shading or color to be used, and compare the rest with this. The plain paper will be the highest or lightest value.

14. Decoration.—Decorative designs should be made an important part of the course in art. A child should early be taught to create new things, as the mere gaining of knowledge is selfish and barren of results. Ornamentation is used for the beautifying of objects created for some purpose independent of its decoration. It therefore follows that the decoration should never interfere with the usefulness of an object or be considered of greater importance than the object itself. The pupil should gradually be led through sequential exercises to an appreciation of good arrangement, spacing and distribution by the study of good examples of simple ornamentation, and to the expression of his own ideas of decoration.

Ornamentation may be derived from geometric forms or from nature. The ornament or design may be, first, a single form or arrangement which is complete in itself, as a rosette; second, a border composed of the same form repeated side by side; third, a space or all-over design in which the pattern is regularly distributed over the entire surface, as is illustrated in wall paper, oil-cloth, carpets or textiles in general. Straight lines are the simplest forms of decoration, and from them an endless number of designs may be made. Curved lines are more difficult to draw, but combinations of curved and straight lines give variety of design. Simple geometric forms are but little more difficult. The drawings on page 550 give examples of all these forms of ornamentation.

Flowers or other natural forms should not be used for decoration, for an ideal or conventional form made from natural forms with the thought of unity, symmetry and order, is always more pleasing to the eye. The conventional form should always preserve the character and life of the natural form so that one can readily trace its origin. Have the children study natural forms, and from a comparison of many leaves of the same kind, lead them to discover the peculiar beauty of each type. In the drawings on page 550 a wild rose has been used as a motive, and several conventional forms made of the leaf, bud, side view of the flower and of the full or front view of the flower. On the same page three designs have been made, using conventional forms of the rose, and in one design a conventionalized leaf is used. A row of conventional forms equally distant from one another will make a border, and even spacing at right angles above and below or diagonally across the paper will make an all-over or space design. A group arranged about a common center will make a rosette or single ornament.[1] Conventionalized flower forms may be combined with leaf forms to make still more beautiful designs. Frequently animal forms are also conventionalized and used in many pleasing designs, though they are not so easily managed. (See Plate V.)

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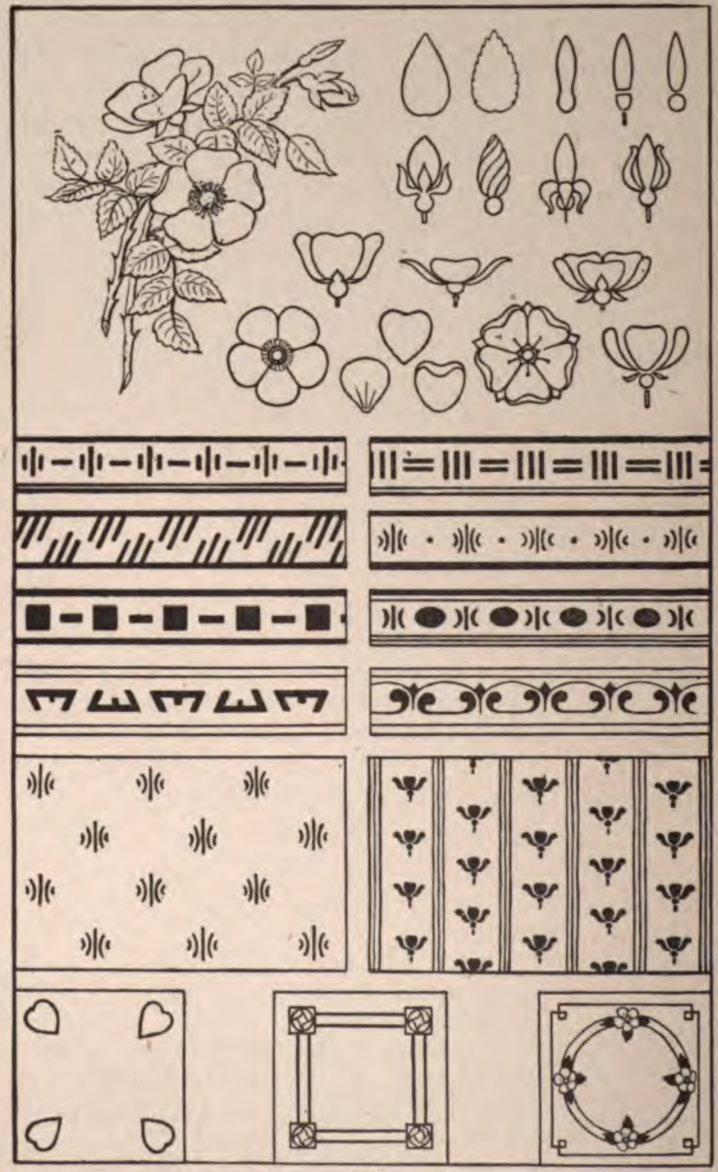
[1] Teachers will find a set of cards giving examples of conventionalized flower forms, and another giving examples of historic ornament quite helpful in teaching decorative designs. These can be purchased at a small cost from Harry W. Poor, Normal School, Boston, Mass.



Be sure to apply designs to the ornamentation of real objects as often as possible, in order that the children may have a definite purpose in making them. Make portfolios, covers for compositions and other written work, paper boxes with a design on the cover, candle shades, paper mats and a variety of other useful objects. All of these can be made of manila paper, excepting perhaps the portfolios. These are better made of cardboard or pasteboard and covered with either manila paper or tinted paper or cloth. All the designs should be neatly carried out. The lines must be of even weight or thickness, and the drawing accurate. Designs may be rendered with a pencil in outline or mass, with brush and ink in light or dark and with color. The color or tone should always be put on with flat washes, that is, without any regard to light or shade or distance. The whole effect must be kept perfectly flat. The accented line has no place in flat decoration.

15. Tracing. In decorative drawings where the motive, that is, the single figure, is not very simple and is repeated over and over again, much time will be saved and a more accurate design secured by the use of a tracing. Any thin, transparent paper will answer the purpose, although a regular tracing paper is better. Lay this thin paper over the motive and carefully trace or follow the outline. Then blacken the back of the tracing paper by rubbing a soft pencil all over it. Do not make it so black that you cannot see through it. Then, with the blackened side down, place the tracing paper in the proper position for the motive. With a pencil trace the lines, bearing on sufficiently to cause the design to be transferred to the paper beneath. If the design is to be reversed, turn the tracing paper over, the pencil side down, and after laying it in the proper position, trace the lines of the design on the back of the tracing paper, with light force. Enough of the pencil mark will be transferred to the paper beneath to be easily followed.

16. Mounting the Pictures.—The drawings will be greatly improved in appearance if they are carefully trimmed and mounted upon heavy paper or cardboard. A soft gray tint or a plain white may be used for the mounts in most instances, though it must be remembered that all paintings cannot be mounted alike if one would bring out the colors to the best advantage. If tinted mounts are used, the tints must be selected to harmonize with the colors of the picture. Very often, that which looks well with one picture spoils another.

17. Collections of Pictures.—The teacher will find of inestimable value a collection of pictures that will illustrate her subjects. These pictures may be collected from magazines, newspapers and any and every source available. Perry prints, the smallest costing only half a cent each, may be obtained of most of the really good pictures.[1] These are not to be copied, but are to be kept always where they may be seen, as unconsciously the children will be influenced by merely looking at them. Encourage the children to make for themselves collections of good pictures, and occasionally give time to talk about and compare these. Japanese prints will be very helpful to illustrate good arrangement and the placing of flowers, grasses, etc.

18. Length of Recitation.—Do not allow the recitations to extend beyond twenty minutes each day, or a half hour three times a week. Much may be accomplished in less time than this. In no case should the lessons be permitted to become tiresome. If the pupils grow restless and seem to lose interest, cut the work short by the substitution of an interesting talk or the exhibition of good pictures. It is not often that this lack of interest will be seen, and it is probable that there will be a tendency to overrun the time.

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[1] See Lesson Two, page 46, for address.

19. Outline for First Year's Work.—The following suggestions are offered for a year in drawing and color work. In some schools more may be accomplished than is indicated here, while in others it may be impossible to do as much. The outline is not meant to be followed strictly as a course of study, and it may be often wise to depart from it, especially if fine, usable materials are available at any time. However, such a year's work as this will be found exceedingly profitable. For convenience, the scheme is classified according to the weeks and months of the school year, though a great deal of latitude must be allowed in administering the outline. Study the suggestions in connection with the illustrations in this lesson, especially with the colored plates and the explanations of them.

(*a*) SEPTEMBER. (1) *First Week.* Give conversational lessons on the color of the sky, the grass and trees as seen on pleasant and on cloudy days, and on the colors that prevail at the different seasons of the year. Whenever possible, illustrate your talk by good pictures.

(2) *Second Week.* Give practice exercises in distributing and placing the materials. Show the pupils how to dampen the paper by means of the water-wash; how to moisten the cake of color, and how to mix a color-wash and apply it to the dampened paper. Paint a clear, blue sky as seen on a pleasant day.

(3) *Third Week.* Show the pupils how to mix blue and yellow to make green for the grass, and how by adding a little red to the green they can make the color less bright. Paint simple landscapes of clear blue sky and soft green grass.

(4) *Fourth Week.* Paint cloudy skies by leaving certain spaces of dampened paper untouched with the blue color. Add the green foreground.

(*b*) OCTOBER. (1) *First Week.* Paint sprays of autumn leaves or showy flowers. Do not be discouraged at the crude results. Even if the subject is not recognizable in the painting, give plenty of credit for honest effort. (See Plate II.)

(2) *Second Week.* Paint bright berries on a branch, and simple fruits.

(3) *Third Week.* Draw seed pods, sturdy grasses and leaves in charcoal mass or with brush and ink or black water color. (See page 546.)

(4) *Fourth Week.* Draw and paint pumpkins. Talk of how they grow and how they are used, especially of how the children use them for jack-o'-lanterns on Hallowe'en.

(*c*) NOVEMBER. (1) *First Week.* Paint simple autumn landscapes and rosy-colored sunset skies. Secure variety in these and encourage originality in the pupils. (See Plates I and IV.)

(2) *Second Week.* Paint and draw fruits and vegetables of simple form in black silhouettes. Place them in different positions to give variety to the work. The children will enjoy bringing the vegetables to serve as subjects. (See Plate III.)

(3) *Third Week.* Paint fruits and vegetables in colors. Again, do not hesitate to call upon the children to bring a fine apple or a large dried ear of corn for the drawing class. It may give unsuspected pleasure and create an abiding interest in the lesson. (See Plate III.)

(4) *Fourth Week.* Draw Thanksgiving turkeys and make simple menu cards. Assist the children in their designs, but do not take all the work upon yourself. Even the youngest will have ideas, and to carry them out means more to him than anything you can direct. (See page 550 and Plate V.)

(*d*) DECEMBER. (1) *First Week.* Paint winter landscapes, leaving the ground uncolored to represent the snow. Add winter sunset skies. Study nature yourself and encourage the children to do so. Be satisfied if the general impression is caught. Do not expect accuracy of details. Encourage the children to watch for bright sunsets, and the day after a particularly brilliant sunset use it as a subject for your lesson. (See Plate I.)

(2) *Second Week.* Draw winter trees. Use both types, those with bare branches from which the leaves have fallen, and the evergreens which still retain their foliage. Draw these in charcoal or brush and ink. Endeavor to have the drawings show the character of the trees.

(3) *Third Week.* Paint Christmas cards, using winter landscapes, holly branches, mistletoe and evergreens for decorations. The children can make a great variety of pretty little things which they will enjoy giving as presents to members of their families. Simple portfolios, bookmarks, blotters, pen-wipers and mats are excellent subjects. (See page 550 and Plate V.)

(4) *Fourth Week.* Devote this week to the illustration of Christmas stories and poems, and to the drawing of toys.

(*e*) JANUARY. (1) *First Week.* Make calendars for the new year, and let the children draw the toys received at Christmas. They will be glad to bring them for the class to see, and will thoroughly enjoy drawing them.

(2) *Second Week.* Introduce geometrical figures. For instance, show that the representation of a sphere is a circle, and convert the circle into an orange, a ball or balloon. Use the cube and let it represent the box and block.

(3) *Third Week.* Draw and paint simple objects such as a mug, a crock, a pan or a straight-sided vase.

(4) *Fourth Week.* Begin the real color study by means of the glass prism and the color charts. (See Plate VI. See also the directions for color study on page 528.)

(*f*) FEBRUARY. (1) *First Week.* Paint stained-glass windows and Japanese lanterns as an exercise in color blending. You will find examples on Plate III.

(2) *Second Week.* Make mass drawings from living animals, such as the cat, dog or bird. As has been suggested before, have the animal brought to school, if possible.

(3) *Third Week.* Illustrate stories about Washington. Draw children marching and paint flags.

(4) *Fourth Week.* Make large-sized action drawings of children, by means of straight lines (see page 535). This should be done on the blackboard, with crayon. Give the children an opportunity to talk about what they have drawn, and make the drawing the basis of the language lesson. This suggestion is one that applies everywhere along the drawing course. Do not discourage efforts at expression, however crude they may appear, so long as they are sincere.

(*g*) MARCH. (1) *First Week.* Paint pussy willows and budded twigs. Illustrate stories or verses.

(2) *Second Week.* Make night landscapes (see Plate IV) and continue the drawing of twigs, calling attention always to the changes that have taken place in the twigs since the last time they were drawn. Willow twigs may be used successively at intervals of a week, and each time by their visible growth they will stimulate observation and call for greater effort in the drawing.

(3) *Third Week.* Illustrate stories that show the action of the wind or the flying of kites. Here is a good time to bring into play some of the pictures you have collected. Take the children out of doors and let one of them stand in the wind to show how the hair and clothing are blown about. (See Plate IV.)

(4) *Fourth Week.* Recur to geometrical figures, such as the rectangle and triangle. Show the application of the

rectangle in the side of a car, the triangle as the front of a chicken coop or a tent, and an ellipse as an egg or body of an animal.

(*h*) April. (1) *First Week.* Paint and draw the early spring flowers in colors and in black silhouette. Use large flowers of simple outline, such as tulips, crocuses and dandelions. (see page 546 and Plate II.) Compare the colors found in these flowers with the colors found in the color charts. Try to reproduce the natural coloring as closely as possible.

(2) *Second Week.* Make a design suitable for the cover of a booklet which is to be used to contain pressed spring

flowers. Study Plate V and page 550 for suggestions in designs for such a booklet. You may not be able to use anything exactly as it is given in this lesson, but you will be helped to make something more original and probably better.

(3) *Third Week.* Paint and draw growing plants in pots and simple flowers in a straight-sided vase of glass. (See page 557.)

(4) *Fourth Week.* Use geometrical forms again. Show the cylinder as transformed into the stump of a tree, a muff or a fire-cracker.

(*i*) MAY. (1) *First Week.* Paint spring landscapes with fresh green grass and clear blue sky, adding now a row of distant trees. (See the second landscape in Plate I.)

(2) *Second Week.* Draw domestic animals and human figures posing, often in mass from memory.

(3) *Third Week.* Use spring flowers and plants for subjects and vary with simple object drawings.

(4) *Fourth Week.* Make a border and a space design, using a single leaf as a motive. (See page 550.)

(*j*) JUNE. (1) *First Week.* Paint a marine scene, light blue sky and deeper or darker blue water. Add a small boat. (Consult here the illustrations on Plate IV.)

(2) *Second Week.* Review the stained-glass window exercise and the evening landscapes. Devise new ones of similar type.

(3) *Third Week.* Make border and space designs, using the blossoms of very simple flowers. Remember to conventionalize them before they are applied. Use these designs on booklet covers or in such a way that the pupils may get the idea of applying decoration to useful objects.

(4) *Fourth Week.* Paint flowers and review any of the exercises which seem to need review.

20. Second and Third Year Work.—The work for the second and third years should follow in general the plan that has been suggested here for the first year, but the problems should all be carried a little farther and gradually made more difficult. For instance, in the landscapes introduce distant and near-by trees, roads, paths and streams or pools of water, figures and small houses. In selecting flowers, leaves and grasses, choose those of more complicated form and more varied outline, or those which have more than one color or are unusual in coloring. Introduce too, the more difficult geometrical forms, such as the cone, pyramid, hemisphere and others. Do not hesitate to spend considerable time in conversation about all the different subjects to be drawn, as one of the main purposes of this work is to develop the powers of observation and expression rather than to acquire perfection in mere drawing.

No subject lends itself more readily to correlation with other branches than does drawing, and the teacher should be on the lookout for opportunities to use drawing to make clear anything that may arise in other lessons. Drawing should never be allowed to degenerate into an unpleasant task, and no such condition will arise if the teacher encourages effort, approves of what has been done and allows freedom in conversation.

Caution. Do not let freedom degenerate into disorder. Teach each pupil to respect the rights of others in conversation as elsewhere.

21. Subjects for Imaginative Drawings.—The teacher will have no difficulty in finding similar bits of description in the reading lessons or elsewhere if she be continually on the watch for them. Many of the simple stories, such as *The Proud Apple Branch*, *Cinderella's Slipper*, *Robinson Crusoe's Boat*, *The Ugly Duckling*, *The Old Woman's Pig* and *Hiawatha*, lend themselves very readily to illustration. Many other exceedingly interesting stories which are suitable for illustration will be found in *Nature Myths and*

Stories, by Flora J. Cook, A. Flanagan & Co., Chicago, $0.25, and *Child's Garden of Verse*, by Robert Louis Stevenson, Rand, McNally & Co., Chicago, $0.50. The keen wits of the little artists will often surprise the teacher in the ingenuity of their designs.

The following quotations will suggest subjects upon which the children can exercise their imaginations:

(*a*) LANDSCAPES.

(1) "Matted with yellow grass the fields lie bare,
Wind-swept and bleak, and disconsolate with rain.
Through misty distances, the leafless trees
Stretch gaunt, bare arms and writhe as if in pain."

(2) "The rain is raining all around,
It falls on field and tree.
It rains on the umbrellas here
And on the ships at sea."

(3) "There is a ship on the sea,
And it is sailing to-night."

(*b*) FIGURES.

(1) "When I was down beside the sea,
A wooden spade they gave to me
To dig the sandy shore."

(2) "Up into the cherry tree
Who should climb but little me?
I held the trunk with both my hands
And looked abroad for foreign lands."

(3) "Bring a comb and play upon it!
Marching here we come!"

(4) A game of marbles. "Knuckle down!"

(5) A picnic in the woods: "Bring your baskets and we'll set the table."

(6) Two boys going fishing: "Where's your bait?"

(*c*) OBJECTS.

(1) "An icicle hung on a red brick wall
And it said to the sun, I don't like you at all!
Drip, drip, drip."

(2) "The old oaken bucket, the iron-bound bucket,
The moss-covered bucket that hung in the well."

(*d*) ANIMALS.

(1) "The owl that watching in the barn,
Sees the mouse creeping in the corn,
Sits still, and shuts his round blue eyes
As if he slept,—until he spies
The little beast within his stretch,
Then starts and seizes on the wretch."

(2) "See the kitten on the wall,
Sporting with the leaves that fall."

22. Helpful Books.—

Augsburg's *Drawing*, Books I and III, Educational Publishing Company, Chicago each	$0.75
Bradley's *Water Colors in the Schoolroom, Teachers' Manual*, Milton Bradley Company, Springfield, Mass	.25
Color Study, Ginn & Co., Chicago	.65
Free Hand Drawing, Teachers' Manual, Ginn & Co., Chicago	.80
Historic Ornament and Design, Ginn & Co., Chicago. (In preparation)	
Practical Drawing Series, Books I, II, III, IV, A. Flanagan & Co., Chicago each	.15
Books V, VI, VII, VIII each	.20
Prang's *Elementary Course in Art Instruction, Teachers' Manual*, Prang Educational Company, Chicago	.75
Prang's *Course in Drawing for Ungraded Schools, Manual*, Prang Educational Company, Chicago	.15
Prang's *Course in Drawing for Graded Schools, Teachers' Manual*, Prang Educational Company, Chicago	.50
Text-books of Art Education, Prang Educational Company, Chicago; Book I, First Year	.25
Book II, Second Year	.30
Book III, Third Year	.35
Westfall, Frances, *Grade Drawing Book*, A. Flanagan Company, Chicago	.25

II. A DISCUSSION OF THE COLORED PLATES

For the benefit of those teachers who have had no personal instruction in the use of water colors, we have added a detailed description of the method by which each of the colored illustrations in this lesson was painted.

There are many ways of handling water colors and the way that is easiest for one may not be for another. So each person must and will work out his own personal method as his experience grows. Some people do excellent work with the paper very wet, while others who do equally pleasing work on dryer paper could not manage a wet paper at all. What follows here, therefore, must be considered as suggestive of one way of working only. It is not intended that the illustrations and designs here given are to be copied by the pupils. Such a course would vitiate instruction. They are intended as suggestive illustrations for the use of the teacher, to be shown to the pupils so that they may have some idea of how a painting should look when completed. In the engraving some of the pictures have been given a more finished appearance than the original paintings possessed. It is not to be expected that the children will achieve the excellence here shown.

23. Landscapes.—(*a*) A SUMMER DAY, PLATE I. This painting is suitable for the early lessons in the first grade. The actual work should be preceded by a conversation on the colors of the sky, in which such questions as the following may be asked: What color is the sky? Is it always the same? What color is it on a bright, warm summer day? What color on a rainy day? What color is it in the evening? Is the sky any bluer high up than it is near the ground? Encourage the pupils to find the same colors in worsted, paper or ribbons, or to tell of things that are of a light blue color.

The whole of the first lesson period may well be spent in conversation.

When they know what color they want to paint the sky, have them find the color in their boxes. The cake of color is, of course, too dark as it is; show them that by mixing a little color with some clear water they can make as light a blue as they want and that by adding more of the color a darker blue can be made. Have them mix the color for themselves and try it repeatedly on a piece of paper until they have a blue that is the same as the sky on a bright, sunshiny day.

In the next lesson, each pupil should have a half sheet of manila paper, a glass of water, a box of colors, a large brush and a piece of blotting paper or cloth upon which to wipe his brush. The teacher should go to the board and mark off a rectangular space corresponding to the shape of the pupil's paper. It may be turned either vertically or horizontally. Divide this space by a line to indicate how much is to be sky and how much ground. It will be seen, if the space is equally divided, giving the same amount of space to each, that the effect will be monotonous. It is better, therefore, to have some difference. This difference can vary greatly, as will be seen by looking at pictures. Sometimes only a very small space is given to the sky, making the ground space the important part of the picture. We also see equally pleasing pictures where the horizon line comes very low. The pupils in the first grade will not appreciate this fact, so the teacher should show them where to divide the space. This line should not be drawn on the paper, however; just bring the sky color down that far and leave it. The pupils are now ready to begin painting their picture.

First, they dip their brushes in clear water and wet the entire surface of the paper. When this has dried in a little, or is just moist enough so that the color blends or spreads out a little from the brush as it touches the paper, fill the brush full of the blue color and begin painting in the upper left-hand corner; sweep it across the entire width of the sky. Just below and touching this first stroke add another and another, adding more water to the color as it is worked downward, to make the lower part of the sky lighter than the upper part.

Do not allow the pupils to work over or scrub in the color. It must be left alone after it is once on the paper. If the color is not smooth enough, another trial should be made on a fresh piece of paper.

When they can paint a fairly smooth sky, they can be shown that by mixing blue and yellow, they can make green for the grass. Any shade of green can be obtained by varying the amount of blue or yellow used, and by adding a little red when a brownish green is wanted. If the sky has become dry while you were mixing the green, take a clean brush and with clear water moisten the painting slightly along the horizon line so that the green will bend enough to avoid a hard or sharp line. Then paint in the green in the same manner as described for the sky.

Observe that the green is stronger in the foreground than in the distance. The pupils of the first grade need not attempt to show this, however. It is enough if they put the color on smoothly.

This simple little landscape is in reality only a wash of two colors, each covering a rectangular space, but if the problem were given to the pupils in that form they would take very little interest in doing it. If they think they are painting a picture, they immediately become interested and are anxious to work.

Spring, summer, autumn and winter scenes, evening and night effects can all be discussed and made in this same simple manner, the color of the ground varying with the season of the year shown. In spring, the grass will be a bright yellow-green; in summer, a deeper or bluer-green. In the autumn it will be varied by brown, yellow and red; in winter, by white, with blue shadows.

(*b*) AN AUTUMN DAY, PLATE I. This painting is a little more difficult than the summer landscape and should not be used before the last half of the first year's work or in the early part of the second year. The sky was painted in the same way as in the summer scene, except that a very little red was added to the blue. When the sky was nearly dry, the row of distant trees was "dropped in"; that is, with a mixture of red and yellow (the autumn colors) in the brush enough color was just touched or dropped off to blend of its own accord, making the outline very soft. A little darker or stronger color was put in near the ground for shadows. The brush did not touch the very top of these trees at all, as it would have made them too distinct and thus destroyed the effect of distance. If the sky had dried so that the color did not blend readily, it would have been wet again with a clean brush and clear water before the trees were put on; but if, on the other hand, the paper had been too wet, they would have grown or spread out altogether too much. Experience is the best teacher here. When the trees were in and partially dry, the ground color, which consists of a mixture of yellow with a little red and blue, was put on.

Avoid getting the colors too strong or vivid, as the effect of the atmosphere is always to soften, or *gray* every color.

(*c*) SUNSET, PLATE I. Here we have more color and an indication of clouds in the sky, a more definite shape to the trees and greater variety in the foreground. This painting is suitable for third grade work. After moistening the whole surface with clear water, as in the other landscapes, begin the sky with a wash of blue in which there is a little red for the upper part of the sky. Then clean the brush as quickly as possible and go over the rest of the sky with a wash of yellow and then add the pink. This must all be done quickly, for if one color is allowed to set or dry at all, the other colors will not blend smoothly and a streaked effect will be the result. The red streaks in the clouds are added after the sky has partly dried.

Notice that in the early evening the contrast of the color of the ground and trees with the sky is greater than in the daytime. The trees are painted the same way as in the autumn landscape, except that the color is made stronger and the outline more clearly defined. The color of the ground is lighter in the distance than in the foreground.

(*d*) A Winter Day, Plate I. This painting is suitable for second and third grade work only, as the details in the trees and the blending of colors in the snow-clad hills are a little difficult to obtain. In this, the darkest part of the sky is at the horizon, so that we began with a light wash and added more color as we worked down. The ground was covered with clear water and, while it was still wet, the blue shadows were blended in very lightly. The distant trees were a gray-blue put on while the surface was wet. The pine trees in the foreground were painted last. The place where they were to be painted was moistened with clear water. The whole tree was painted in with a light yellow-green, and allowed to blend into the background. Then with dark green and brown the shadows were added in the trees. This landscape might be used for first grade work by omitting the trees.

(*e*) Flat Landscapes, Plate IV. These two sketches are suitable for third grade work and are put in to show how the value or relative light and dark parts of the picture change with the light. In the first or daylight picture, the boat is the lightest object or lightest part of the picture, while at night it becomes the darkest as seen against the light. In the daylight picture the water is darker than the land. At night the land appears the darker. Both of these landscapes were painted in perfectly flat colors; that is, no shading or blending was attempted.

The effect of such a picture is nearly the same as if each part had been cut out of a plain colored paper and all pasted together in their respective places. In painting the water, streaks of the white paper have been left to indicate the light shining upon it. In the night picture, a few strokes of dark color, the same as that used in the boat, have been added. These serve to intensify the light strokes. This is a conventionalized treatment of a landscape.

(*f*) WINTER COASTING SCENE, PLATE IV. This landscape is quite similar to others described, but there is an important addition in the shape of figures. These were painted in after the landscape part was completed. If the paper had dried it would have been moistened where the figures were to be placed, so that no hard lines would have been left. Notice that the color of the distant sled and the clothing of the children were painted in much softer or grayer colors than were the near-by figure and the sled. If they were just as bright in color, they would seem to be much nearer. Notice, too, the perspective in the drawing—how much larger the child in the foreground was drawn than the children on the sled. Action is indicated by the way the children's caps are flying back and by the strained positions in which they sit.

(*g*) AN APPLE TREE IN THE FOUR SEASONS, PLATE IV. This is a nice exercise for observation and coloring and is suitable for children in the second and third grades. In the spring the tree is in bloom and the dominating color is a pale pink. The leaves and grass are a yellow green. In summer the leaves and grass take on a deeper green cast and the pink disappears. In the autumn the leaves and grass have turned yellow and brown. In winter the leaves and grass are gone and the bare blue-gray branches are left, while the ground is white with snow. In each of these pictures the sky and ground were painted first, and while the paper was wet the coloring of the tree was put on and allowed to blend into the sky. In such exercises the character or kind of tree represented must be preserved in the drawing.

Show other kinds of trees in the different seasons. The pupils should have had practice in drawing trees in black and white with chalk, pencil and brush and ink before they attempt this exercise.

24. Flowers, Plate II.—(*a*) PUSSY WILLOWS. Pupils below the third grade would not be able to bring out as much detail as is shown in this sketch, but pussy willows make excellent subjects for first and second grade work if they are done in a simpler way. The catkin was painted with a light gray wash made by mixing all three colors, and before this dried a little stronger color was added to the under part, letting it blend of its own accord in order to give a soft and rounded effect.

(*b*) DANDELIONS. This subject and its treatment are suitable for first grade work. The blossoms were painted in roughly with bright yellow. When this color was partly dry a little red was mixed with the yellow to indicate some detail in the center of the flower. The ragged yellow-green leaves were blocked in quickly without showing any detail, letting the color and outline tell what kind of leaves they were.

(*c*) MAPLE LEAF. Such pretty leaves as this can be made by children of the first grade. The entire leaf was blocked in quickly with the brush full of light yellow color. Care was taken to preserve the shape and character of the leaf. Before this yellow wash had dried, the red and green were "dropped in" to give the variegated coloring.

(*d*) CLOVER BLOSSOMS. This is a more difficult painting and is suitable for second and third grade children. The flower was blocked in with a light lavender wash made by mixing red and blue. A few spots of white paper were left to represent the high lights. The shadow, or darker side of the blossom, was put on with a darker shade of lavender or purple and some of the details of the flower were indicated in the same way. The leaves were first painted with a wash of pale yellow-green, as near the color of the light marking of the leaf as possible. Then, when this color had nearly dried, the darker green was put on, leaving the light green to form the marking on the leaf. Some would paint these leaves all over in the darker green and then wipe the light streaks out with a clean and almost dry brush.

25. Objects, Plate III.—(*a*) CROCK. This is a painting suitable for first grade work. After the paper was dampened with clear water, the whole object was first blocked in with a wash of grayish-yellow color, except that a streak of white paper was left for a high light on the brim. Then, with a stronger or darker wash of the same color, the shaded sides of the crock were painted over this. Notice that the shading on the inside of the crock is at the left, the shading on the outside at the right, or the opposite side. This is the opening shown.

(*b*) TURNIP. This painting as executed here is suitable for second and third grades. After the pupils have been making black and white drawings they will enjoy doing them in color. This turnip was first blocked in on the dampened paper with a very light grayish-yellow, and before this had dried, a little stronger color was added to the under or shaded side and then the purple top was put on. The leaves, first painted with a light green, and then a few darker touches were added for detail. If the turnip is placed on a surface near the color of the manila paper, the shadow cast will be a brownish gray.

(*c*) CHERRIES. This is a picture suitable for second and third grades. A little yellow was mixed with the red and the cherries blocked in with this color, white spots being left for the high lights. The shaded sides have blue mixed with the red. The leaves must be painted in directly, that is, without going over any part of them more than once.

(*d*) MUG AND LEMON. Such accuracy as is shown in this painting cannot well be expected before the end of the third year, though drawings similar to it may be made much earlier. The combination of two objects may be attempted as soon as the pupils can manage one fairly well. The mug was painted in the same way and with the same colors as the crock already described. The part covered by the lemon was left blank. The lemon was painted in in a bright yellow with just a touch of blue to give a slight greenish cast. Then a little stronger yellow was mixed for the under or shaded side and put on while the light yellow was still wet. Hard outlines were avoided by keeping the paper a little damp. The shadow was added last by having the paper wet with clear water and then putting the strongest color near the objects and letting it blend off into nothing.

(*e*) LANTERN. The Japanese lantern shown in the picture is a fine subject for second and third grades. The outline was drawn with a very little color, but a very light pencil line would have answered the purpose equally well. A wash of clear water was put over the whole surface, except the top and bottom pieces, and while this was quite wet the brush was filled with a strong red color and the upper part of the lantern painted, the color being allowed to spread as it would at the lower edge. Then the red was all cleaned out of the brush and it was filled with yellow. This was done very quickly, so that the red would not settle or dry. The brush was touched to the lower part of the red, causing the yellow to blend with the red on the one side and into some of the remaining white space on the other side. Then a little blue was "dropped in" and allowed to blend with the red, making a purple. Some of the paper was left white. After the colors had set, a few strokes of strong red were added to give a rounded appearance. These followed the curve or shape of the lantern. The top and bottom pieces were painted last with a strong mixture of all three colors, which is nearly black. The high lights were left white.

(*f*) STAINED GLASS WINDOWS. This is a subject for the first grade and can be given very early in the course. It is an excellent way to teach color blending and children find it fascinating. The method of making it has been sufficiently described on page 531.

26. Designs, Plate V.—At the top of the page are four single ornaments, each of which is complete in itself. They were first drawn in in pencil and then each color put on as evenly as possible and left to dry thoroughly before another was added. In designs the outlines must be kept clear and distinct and one color not allowed to blend into another as is desirable in realistic painting. Enough color to complete the design must always be thoroughly mixed before commencing to paint, as it is always difficult to match a color.

Two border designs are shown where a single leaf is the motive. Draw the top and bottom lines across the paper. Then, to divide the spaces equally, take a narrow strip of paper of the same length as the border and fold it together through the middle, then a second time through the middle and a third, until the desired space is reached. Crease the folds tightly and open out the strip. Each crease will then mark a point at which to place a leaf or whatever the motive for the design is to be. First grade pupils may be allowed to do their spacing free hand. One border is shown where a single flower form is the motive and a little dot is used to form a connecting link between them. In another border a whole plant has been conventionalized and repeated as a design. Besides this, two borders using animal forms are shown. In each one of these the outline was first drawn in pencil and repeated by means of tracing (See page 551). In coloring the duck design, first paint the moons in a pale yellow; then, when this color has thoroughly dried, paint the sky or background in a dull gray-green. Let this dry and then paint the ducks in a much darker or stronger wash of the same color. Care must be taken to keep the outlines of the animals true. The spelling book cover offers a suggestion for using simple geometric forms and bright colors. A conventionalized thistle is used to decorate a cover for a nature study composition or story. Notice that in each of these color designs the lettering has much to do with the composition of the page. At the right side of the plate is a design suitable for the cover of a picture portfolio. A suggestion for an Easter design is given below the cover design and at the bottom of the page are shown two space designs. In each of the latter a simple leaf form has been used as the motive. In the design at the left, each leaf stands alone and the interest of the design is in the arrangement and the spacing. These leaves might be placed in a great many different positions, producing entirely new effects. Such a design as this can be used for various patterns of dress goods, carpets or wall paper. The design at the right is formed by placing four leaves in a group about a common center or point. The squares are marked off by broad lines. Such a design would be suitable for oilcloth and tiles. A flower form might be substituted for the group of leaves. On page 550 are given other designs in black and white.

If the pupils have been led to see the beauty in the common things around them; to appreciate even in a small degree good pictures or illustrations as a result of their constant association with them; to desire to make something really good themselves; and if, as a result, they can make a reasonably true picture, which, though in a crude way, tells nōt only what they saw but what they thought about the object, the course in drawing has been a great success and the teacher should be congratulated.

> "Step by step lifts bad to good,
> Without halting, without rest,
> Lifting Better up to Best."

TEST QUESTIONS

1. What is drawing? Discuss the subject fully. How are we to understand the term drawing as applied to a branch of study?

2. (*a*) Why should drawing be a part of the school curriculum? (*b*) Tell freely several ways in which drawing may be correlated with other subjects.

3. What is the specific value of each of the following ways of drawing, viz., pencil, brush and ink, water color, charcoal, blackboard?

4. (*a*) Name the primary and secondary colors and tell why they are so called. (*b*) What is meant by (1) complementary colors; (2) tints; (3) shades?

5. Name six subjects suitable for first grade drawings and tell how you would present three of them to your class.

6. (*a*) What is meant by perspective drawing? Describe the two kinds of perspective. (*b*) What is a finder and what is its use?

7. (*a*) What is meant by a conventionalized design? (*b*) Why is the knowledge and practice of decorative design important?

8. Quote three prose selections or verses not given in this lesson that are suitable for illustration by children in the first three grades.

9. Make a brush and ink drawing of an oak tree.

10. Make an autumn day landscape in water colors, or a pencil illustration of some verse you may select.

THE LITTLE SHEPHERDESS

LESSON TWENTY

MUSIC

1. The Aim of Music in the Public Schools.—Public school music has suffered from a misapprehension, on the part of the general public and most teachers, of its aims and possibilities. Music has been looked upon as an accomplishment for the talented and its study has been confined to those who displayed unusual ability or taste in that direction. This is no more reasonable than to say that because a child does not show evidences of becoming a great mathematician he should not study arithmetic.

Music has great educational value. Probably no one would deny its value as a culture study, but not all appreciate that in addition there is no other subject in the school curriculum more useful in training the senses and in mental discipline. Properly taught, music trains the ear, the eye, the voice and the hand and furnishes the best kind of exercise for the intellect. It is not the aim of public school music to turn out *musicians*, but to make appreciative listeners, to open up a world of esthetic enjoyment and culture for those who otherwise would never know this pleasure, and to arouse and strengthen the pupils so that they will do better work in every other study.

There is a certain fundamental knowledge of music that everyone can acquire. Any teacher who can teach reading can teach music, even if her knowledge of the subject is limited—provided always that she is willing to make the necessary effort. She should be able to sing the scale correctly; she should be able to detect inaccurate tones and she should have some knowledge of music notation. Given these, plus a willingness to apply herself to the task in hand, she can begin the teaching of music and will find herself growing in power as the children advance.

2. **Material.**—The teacher should provide herself with a pitch-pipe (the Congdon Chromatic pitch-pipe is the best[1]) and a blackboard staff liner.[2] She should have a plentiful supply of rote songs, among the best collections of which are the *Songs of the Child World* by Jessie L. Gaynor, and *Songs and Games for Little Ones* by Mildred and Pattie Hill. (See Bibliography.) A copy of the *Rote Song Book*, *First Steps in Music*, by Ripley and Tapper, will give the greatest possible help in the beginning. Later a book that will furnish material for practice is necessary for the pupils. For this purpose the *Harmonic Primer* by Ripley and Tapper is among the best. Charts, too, are necessary for the same purpose. If the board will not furnish them, the teacher can obtain the charts in pamphlet form and put the exercises on the board.

3. **Care of the Children's Voices.**—It is of the utmost importance that the teacher understand how to take care of the children's voices. This does not mean that she must give a course in voice culture, but it does mean that she should know how to preserve the natural voices of the children. There are a few simple rules, which, if followed, will be very effective.

First, remember that there is much more danger of singing too low than of singing too high. A child's voice is naturally high and clear and ought to be sweet rather than shrill. To preserve this child quality, everything should be sung in a high pitch. It is a good general rule to have the songs and exercises lie within the compass of the staff; that is, not below *e*, first line, or above *f*, fifth line, although the voices can be carried higher than *f*, and they can go lower than *e* if they start high and sing down and back. Many of the rote songs should be pitched higher than they are written. This may not be comfortable for the teacher unless she happens to be blessed with a high soprano voice, but she must remember that the children are to do the singing. While she is teaching the rote song she can pitch it for her own voice, but when the children have learned the melody, it must be pitched for their voices. The teacher should not sing *with* the pupils after they have learned the song.

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[1] Lyon & Healy, 199 Wabash Avenue, Chicago, or any music store, will furnish this. The price is about 15 cents.

[2] A good staff liner may be secured from the Atlas School Supply Company, 315 Wabash Avenue, Chicago, for about 20 cents.

In teaching the scale start with high *do* and sing down and up. In all vocal and scale drills follow the same rule.

Have them sing the scale with the syllables *loo* and *coo*, both of which give a sweet, smooth tone.

In pronouncing words, as also in giving the scale syllables, dwell on the vowel sounds and not upon the consonants.

More can be done for the voices of children in singing songs than in any other way, for here we have the *emotional* interpretation, of which more will be said under the head of *Rote Songs*.

Never allow the children to *shout*. Work for a clear, light, sweet tone, not for volume. It is better to say to the children, "sing sweetly" or "sing lightly," rather than always "sing softly." Just to say "softly" sometimes cultivates a suppressed, dead tone. What we want is a vital tone without harshness. Insist that everything, whether it be a scale drill, sight reading exercise or song, be given with this good tone. This brings better results than many vocal drills.

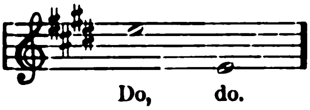
4. General Principles of Method.—Music is a language, and teaching music, in process, is much like teaching a child to use and read his "mother tongue." There is this difference for the teacher, however: A child comes to school with a certain vocabulary of words. He can talk. He has ideas which he can express in spoken language. He has no vocabulary of tones. The teacher must do for him in music what the mother and his brothers and sisters have done in the use of words. She must furnish the vocabulary. She must lead him to express himself in tones. This power he acquires by imitation. When he can imitate he must learn to recognize what he hears. When he can hear tones and recognize them he is ready for a written representation of them, or what we call music notation. The final step is the interpretation of the written signs—or reading music—commonly termed sight reading. The steps in method, then, are imitation, recognition, representation and interpretation.

5. Imitation.—(*a*) THE ROTE SONG. The rote song, or song to be taught by imitation, is the foundation of music study. By means of it a child's musical sensibilities are aroused, his feeling for melody and rhythm awakened. The songs should be selected with care that they be within the child's voice range, that the melody is simple and the rhythm well marked. Care must be taken, too, to select songs having the right kind of words. Mere doggerel will not do. The poem should be good as a poem without the music. It should be something that appeals to the child, either to his experience or his imagination. Children like fanciful things and even nonsense verses. The songs may be selected to correlate with the nature study, the geography, the study of trades and industries, etc. There are many beautiful songs of the seasons. In this way the music may enrich all the other subjects and stimulate the child's interest in everything.

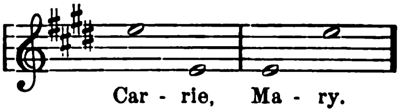
In presenting the song it is well to lead up to it by means of some informal conversation or a story, but do not insult the children's intelligence by an elaborate introduction to something with which they are perfectly familiar. When they are interested in what the song has to say, sing the entire song, so that they will have the whole story. Then sing the first verse, or the whole song, several times until the melody is fairly well fixed. After that, take it phrase by phrase, having the children sing each phrase after it is sung by the teacher, until the entire song is memorized. Songs may be taught by rote just as long as the songs you want the children to sing are beyond their ability to read.

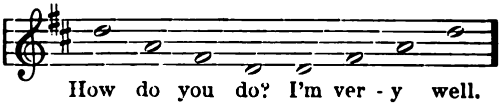
Caution. Do not make the mistake of teaching too many songs. Children love to sing the same things over and over. More than that, the song should always be sung with the same thoughtful interpretation given it at the first rendering. If this is done, you will find there is a limit to the number of songs they can master.

(*b*) UNITING THE VOICES. While the class as a whole will be able to learn the songs in the manner described above, there will be many little voices that will waver from the tune and probably only a very few that could carry the tune alone. It is therefore necessary to carry on another line of work parallel to this song singing. The first step in this more definite study is to unite the voices on a single tone. Let the teacher sing any tone (as *C*, third space; *D*, fourth line) with any syllable—*dō*, *lōō*, *kōō*, *nō*—and have the children imitate the sound. Hold it until all the wavering tones unite on the correct pitch. Then try another tone. When they can imitate the one tone correctly, give them two tones, an octave apart, as:



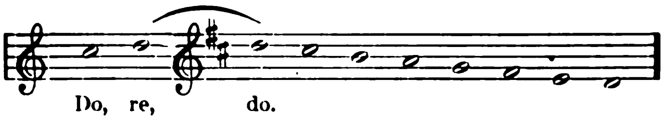
Then give them groups of tones—anything that suggests itself to you—like *sol*, *do*, *mi; do*, *mi*, *sol; sol*, *la*, *ti*, *do; do*, *re*, *ti*, *do; do*, *mi*, *sol*, *do*, remembering always to keep the pitch high. Make the exercise a play and call the children by name in tune, for instance,





And so on. Use ingenuity in making up different combinations, but do not keep it up too long. The whole object of the exercise is to develop the power to hear accurately and imitate exactly. Have each one try alone. Individual work should be emphasized throughout the music course. Next teach the scale as a melody, beginning on high *do*. This may be taught first as a little song (see scale songs in *Rote Song Book*), then with *loo*, then with the syllables, *do*, *ti*, *la*, *sol*, *fa*, *mi*, *re*, *do;* ascending, *do*, *re*, *mi*, *fa*, *sol*, *la*, *ti*, *do*. Drill on the scale tones until they are very familiar, but do not keep the children at that kind of work more than four or five minutes at a time. All drill should be given with absolute attention and concentration and with children this cannot be sustained long.

When the pupils can sing the scale with the syllables, have them sing it in different keys and practice changing from one key to another. Have them sing the high *do* and the *re* above, hold this tone (*re*) and call it *do*, then sing down the scale. In staff notation the exercise is this:

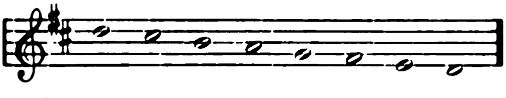


You will probably have to show them how to do this the first time, but they soon master it. When they have done so, a great point is gained; for all the work in modulation and changing of key—as well as much of the drill in chromatics and minor—depends on their abilty to do just this thing.

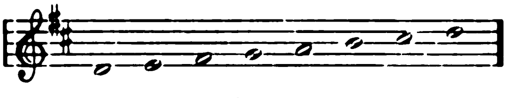
Taking *C* for the starting point every time, have the pupils sing *do*, *re*, *mi*—change *mi* to *do*, and then sing down the scale. Let them sing down to *sol;* change *sol* to *do*. Once they have the idea the exercise is very simple.

6. Recognition of Tone.—To hear and to imitate is only the first step toward the mastery of a language. In music, the pupils must be led to discriminate between tones and to recognize what they hear. Let the teacher hum or sing with *loo*, the first phrase of any song which the children know and see if they can give her the correct words. Later she may select any phrase in a song and see if it is recognized. This can always be made an interesting game.

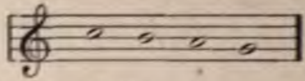
Leading to more definite tone recognition, the teacher sings the scale thus:



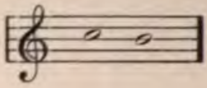
saying, "This is the scale down." Then,



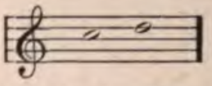
"This is the scale up." Then sing or hum three or four tones, as,



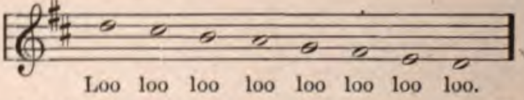
and ask the children if the voice goes up or down. Continue that practice with various exercises until they can always tell whether the progression is upward or downward. Try them with just two tones and see if they can tell which is high and which low. Begin with a large interval, like the octave. When they can tell that



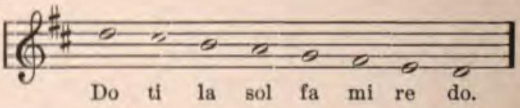
is down, and



is up, a distinct point is gained. Then sing

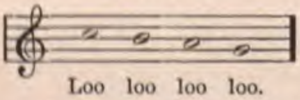


and ask the children to give the syllable names. They will sing back

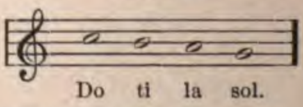


Then sing or hum various combinations, the pupils replying with syllable names; as,

TEACHER

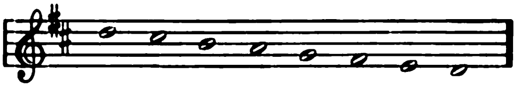


PUPILS



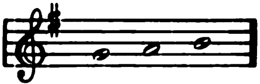
These exercises should be progressive, easily so, gradually increasing the number of tones and the difficulty of the combination. A good series may be found in the *Rote Song Book*.

7. **Representation of Tone.** — When the children have gained considerable facility in recognizing tone, they are ready for some representation of it. As the staff notation is the one they will always have to read, it is the best to give it from the start. So let the teacher draw the staff, and place the clef and key signature. Have the children sing the scale and then say to them, "This is the way we write it:"



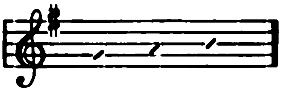
Have the children practice putting the notes of the scale in different positions, the teacher making the staff, placing clef and key signature, telling the pupils where to place *do*. Then sing or hum the same simple exercises that have already been used in training them in recognition. Have the pupils sing the exercises back to you with the syllables, and as they sing them write the notes on the staff. Do not have them take the time to make the round notes, but let them *write* the music thus:

The teacher sings



Loo loo loo.

and the pupil writes

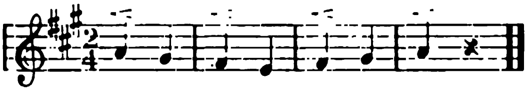


He can make these little straight lines as he sings the tones and afterwards can make them into round notes, if desired. That is not essential. It is very easy to change these marks (▬ ▬) to quarter notes by adding a stem (♩♩) or to eighth notes by adding stem and flag (♪♪). What we are working for here is location of pitch on the staff, and it is not wise to give the children too many things to think about at one time. This recognition of tone is the most practical ear training; the writing trains both hand and eye.

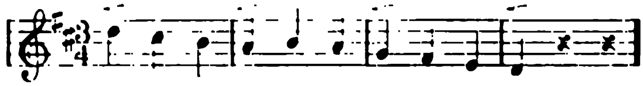
The exercises should increase in difficulty as rapidly as possible, consistent with accuracy. It is better always to begin the drill with the simpler combinations, for some of the children are much slower than others and cannot hear many tones. All the principles of sense training will apply to this work, for the proper study of music is essentially a training of the senses.

Music notation should mean for the child only the written representation of what he *hears*, either in audible sound or in his "mind's ear." If this order, recognition, *then* representation, is followed, much of what has seemed difficult in music teaching will disappear. There has in the past been too much study of *signs* and not enough study of the things for which the signs stand, just as in reading there was too much study of words and not of the ideas they represent. The *things* or *ideas* with which music deals are tones and combinations of tones, and the avenue by which they reach the mind is the auditory nerve; hence, the importance of *hearing* before attempting to *read*. The ability to hear with the mind's ear is as important as to see with the mind's eye.

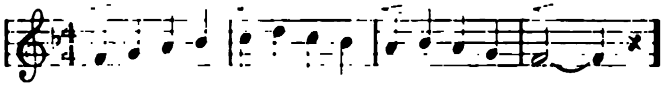
8. Recognition of Rhythm. — There are two elements in music: they are tone, or tune, and rhythm. In the rote song the child has experience with both. In fact, all music, even the simplest exercise, must combine the two elements. In the exercises given above the teacher supplies the rhythmical element in her singing of the little tunes and she should always be careful to sing them rhythmically as *tunes*, not as detached tones. One tone by itself has no meaning. In the rote song the children have learned to feel the measure—the two-beat, three-beat and four-beat measure— and to feel the swing and movement of the music. Now we must bring this into simple form for them to recognize it definitely. The teacher should sing any little exercise like



with a very marked accent on the first note in each measure. Let the children clap their hands for the beats, a loud clap for the accented beat, a soft one for the unaccented. Let them make circles in the air, a large one for the accented beat and a small one for the unaccented. Do the same thing with an exercise having three beats to a measure; as,

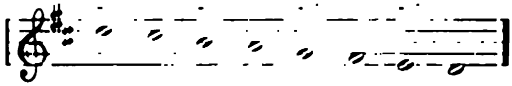


and with four beats; as,

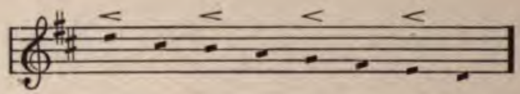


Sing any tune that you happen to know with a marked accent and then have them discover the number of beats in a measure. This can be made a very interesting exercise, but do not keep it up beyond the point of usefulness.

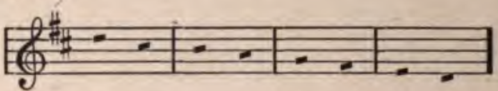
9. **Representation of Rhythm.** — Sing the scale with accent, as follows:



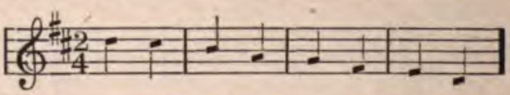
Write as you sing it:



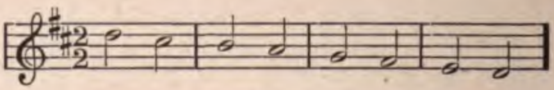
Then tell the pupils you will put a *bar* before the note that has the accent. There is already a bar at the beginning of the staff so the first one comes just before the third note. Sing the exercise through again, putting the bar in the proper place as you sing and a *double bar* at the end, and you have this notation:



Then make the notes quarters by adding the stem. Sing the exercise as you put in the stems. Then place the meter signature, $\frac{2}{4}$, and you have the complete exercise:



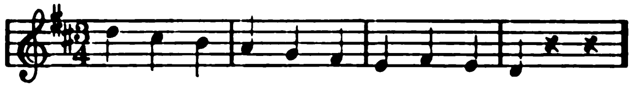
Or, you can make them half notes and the signature will be $\frac{2}{2}$; as,



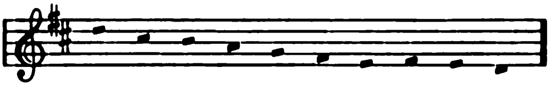
Whole notes will give the signature $\frac{2}{1}$.

Let the pupils know at once that the upper figure of the meter signature shows how many *beats* in a measure and the lower figure shows what kind of a note receives one beat. After this let the exercise combine tone and rhythm, except the more difficult tone combinations, following the above process.

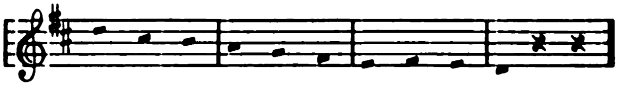
For instance, the teacher sings,



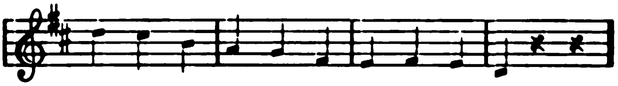
The pupils sing and write as they sing, the teacher drawing the staff and placing the clef and the key signature.



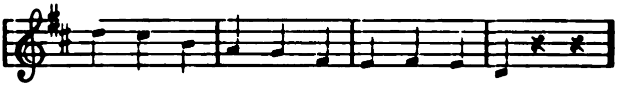
Then sing it again, this time the pupils putting in the bars; as,



Again they sing it, putting the stem to the notes; as,



After this the pupils may determine what the meter signature will be. It is $\frac{3}{4}$, which is put in its proper place, and they have this complete little melody:



This shows the process of recognition and the representation of what is heard, and this same process should be carried throughout the entire music course, both for the presentation of all new points and for the frequent practice in ear training. An easily progressive series of exercises in both tone and rhythm will be found in the *Rote Song Book*.

10. Interpretation.—(*a*) DEFINITION. The last step in the process is the interpretation of the printed signs or the translation of the printed music to the vocal music—in other words, it is "reading music," just as reading English is the translation of the printed language into spoken language. This is what is commonly called "sight reading."

(*b*) METHODS. (1) *Variety.* There is no reason why a pupil should not read a page of his music primer or reader as readily as he does his English primer. The secret of both is in much practice. When pupils have a certain vocabulary of words, the teacher does not spend all her time in the effort to increase this vocabulary. What she does is to give the class many combinations of these same words. Each sentence is read in a manner to express the idea embodied and not as a mere calling of words. The same sentence is not repeated until it is committed to memory, for this is not reading, but the same words are arranged in different expressions. The same principles must be applied to the reading of music. When the pupils can read a simple exercise made up of the consecutive scale tones—that is, having no skips—he should not at once be put on something more difficult, but should have many exercises of the same grade.

(2) *Rhythm.* There should be many exercises containing only consecutive tones in different keys, before rhythm is introduced into the reading, then many exercises in consecutive tones and the simplest rhythms in different keys and meters. There should be some drill on skips without meter signature, then many reading exercises in different keys containing skips and with simple rhythm. The music reading should be done in the same manner as the English reading. Have the pupil look the exercise through from the beginning to the end to see what is the musical idea, then let him sing it as a complete sentence or phrase. Form the habit of reading the exercise or song through to the end at the first trial, for reading at first sight is largely a matter of habit. Even if there is an error, it is better to go on to the end and then correct the error in that exercise or call the

pupils' attention to it and give them another exercise containing the same point.

(3) *Tempo.* Cultivate the habit of reading the exercise in good tempo. Do not let the pupils think because the exercise is new it must be taken very slowly. That is not reading; it is only picking out the notes. To read is to give the correct tone with the correct time to each and at a good rate of speed. You will find that the rhythm often carries the class along and helps over some difficult places. Be sure to have the accent marked and the tone good. In other words, make the reading of every exercise, no matter how simple, the interpretation of the writer's thought. The artistic rendering of a song is nothing more nor less than carrying out this principle.

(4) *Expression.* A song is a poem in a musical setting. If the music is well written, it expresses in tones what the poem expresses in words. The two together should give a fuller and more beautiful expression than either alone. Be sure that the children understand what the poem means, and that in singing the song they are to tell with their voices all that the poet and the composer meant to tell. Have the pronunciation and the enunciation clear, dwell on the vowel sounds rather than on the consonants and have the tones well forward; that is, have them think of the tones as on the lips. Have them feel that they are singing to you, that they are telling the thought or story to some one. This will bring a vital tone. It is this sympathetic quality that pleases when we hear it, although we may not know what it is. Without it, the most perfect voice and most perfect vocal technique is cold and fails to touch our hearts. When endowed with the sympathetic quality, and only then, does music have its full meaning.

11. Order of Development.—(*a*) THE NATURAL PROCESS. This lesson is planned to cover the work that should be accomplished in the first three grades of an eight-grade school when the subject is well established and the pupils quite up to grade. The order of development would be the same wherever the subject is introduced for the first time. The method would be the same, except that with older pupils much less time would be given to the imitation period, while recognition, representation and interpretation would progress almost simultaneously. The process is as follows:

1. Rote songs for primary pupils have already been discussed. With older pupils the singing of songs learned by imitation will serve several purposes. By careful interpretation of the songs, the voices are brought into tune and music made to have a new meaning. There is no better way to inspire patriotism than to sing our national songs in a manner to express all that the poets and composers felt when writing them. The singing of such songs as *Old Folks at Home* and *My Old Kentucky Home* will do wonders toward strengthening the home feeling. Much of national character and history can be brought out by such songs as *Auld Lang Syne*, *Blue Bells of Scotland*, *Gayly the Troubadour*, *The Harp that Once thro' Tara's Halls*, *The Alpine Horn*, and so on. In this way music can, from the start, serve to enrich the study of history, literature and nature. It can broaden and deepen the pupils' sympathies and add vastly to their appreciation of the good and the beautiful. It serves an excellent social purpose, for in no other exercise is it so necessary for each one to work for the good of all. In chorus singing one voice out of tune can spoil the whole performance. Accordingly, the rote songs for older pupils should be selected from the best of our old and familiar songs. Another point in favor of these songs is that there will usually be some pupils in the class who already know them and so can help the teacher.
2. Voices united in single tones by imitation.
3. The scale learned as a melody. With older pupils,

the scale should be represented in different keys as soon as they can sing it.

4. The recognition of tones of the scale when sung by the teacher to some neutral syllable, as *loo*, *koo*, *hm*, etc.

5. Writing of the tones recognized.

6. The reading of exercises of the same character. With older pupils these three points (4, 5 and 6) can be taken in one lesson.

7. As soon as a certain facility is gained in recognition of tone, the element of rhythm is added.

(*b*) SYLLABUS FOR FIRST THREE YEARS. Keeping in mind this method of presenting every new point, first through the ear, the order of development would be as follows:

(1) *First Year. The Scale.* Exercises in consecutive tones; that is, without skips.

Exercises in simple rhythms without skips, say in [illegible] and [illegible] or [illegible] and [illegible] meters.

Exercises with skips. This brings about the study of the individual tones of the scales and gives the power to come back to any particular tone from any other tone. First study upper *do*. Have the pupils sing *do-ti*, *ti-do*, dwelling a little on *ti*. Then *do-ti-la* and repeating *la*, sing *la-do*, and so on. *Do-ti-la-sol; sol-do; do-ti-la-sol-fa*, *fa-do; do-ti-la-sol-fa-mi*, *mi-do; do-ti-la-sol-fa-mi-re*, *re-do; do-ti-la-sol-fa-mi-re-do'*, *do,-do';* (high *do* is represented thus—*do';* and low *do*, *do,*). Then study lower *do* in the same way. Give this in the key of *D* or *E*; *do,-re; re-do,; do,-re-mi*, *mi-do,*, etc. Next study *sol*, taking it in the key of *F* or *G* and the exercises will be *do,-re-mi-fa-sol; sol-fa*, *fa-sol; sol-fa-mi*, *mi-sol; sol-fa-mi-re*, *re-sol; sol-fa-mi-re-do,*, *do-sol; do,-ti-la-sol; sol-la*, *la-sol; sol-la-ti*, *ti-sol; sol-la-ti-do,*, *do-sol.* Next study *fa;* then *ti*. All of these should be put upon the staff, the teacher singing, the pupils recognizing and writing. If she has a chart, these drills will be found printed in full, so that by using the pointer she can give a rapid drill in using the various skips. Then the pupils should read some exercises in simple rhythm containing some of the easier skips. Nothing is said in these grades about keys; the teacher tells the pupil where to find *do*.

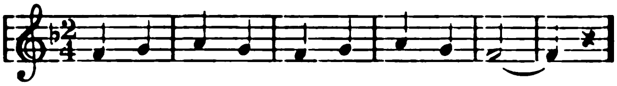
(2) *Second Year.* Review of first year's work.

Study of the remaining tones of the scale, which are *mi*, *re* and *la*. The pupils should have many opportunities in this grade to read simple exercises. By that we mean exercises in simple rhythm, containing no skips.

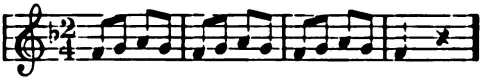
During the year all the common meter signatures should be introduced, $\frac{2}{2}$, $\frac{3}{2}$, $\frac{2}{4}$, $\frac{3}{4}$, $\frac{3}{8}$, $\frac{4}{4}$, $\frac{6}{8}$. The only variation or difficulty in rhythm should be the use of the short note and the long note. The short note receives one beat or count, the long one receives two or more beats. For instance, with a meter signature of $\frac{2}{2}$ the exercise will contain half notes and whole notes; with $\frac{2}{4}$ there will be quarter notes and half notes, and so on. Remember these exercises should be in various keys and during the year the pupils' attention should be called to the key signatures as a means of determining the position of *do* on the staff. No effort should by made to teach *keys*. What we are working for is facility in reading simple exercises, not theoretic knowledge. For the sight reading practice, the pupils should have a book of graded exercises and songs. With little children, the rote songs should be continued and about one-half the music should be given to singing of songs.

(3) *Third Year.* Review what has been done in the first and second years. This does not mean that you should go over the same material. It means that the pupils must read many exercises embodying the principles previously taught and not containing new difficulties. This is what makes quick, ready readers.

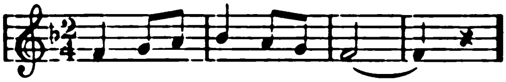
The new points presented in the third year are the divided beat and the chromatics, sharp four and flat seven. To present the divided beat, let the teacher first sing,



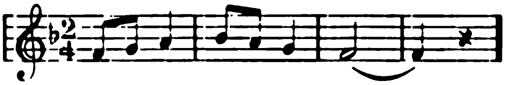
with a decided accent, and have the pupils tell the number of beats in a measure, also the number of tones to one beat. Write it on the blackboard. Then the teacher should sing, beating time while she sings,



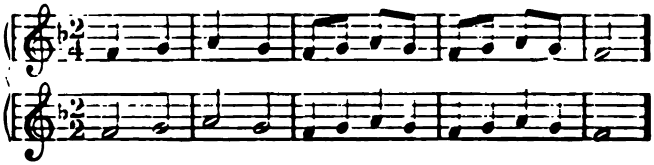
It may be necessary to repeat this several times before they hear two tones to a beat; when they have heard the phrase write it on the board, as above. Then take various combinations of divided and undivided beats; as,



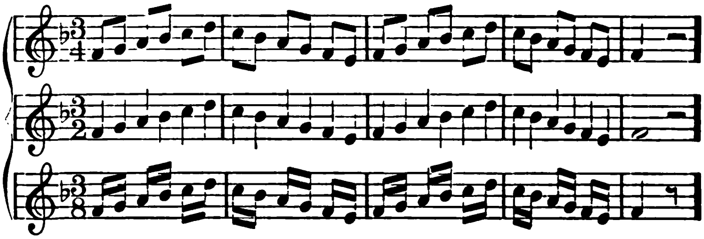
and



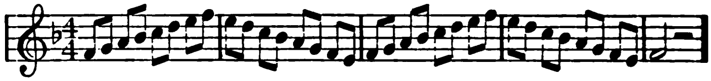
This is the rhythmical problem and during the year should be worked out in all of the different meters, $\frac{2}{4}$, $\frac{3}{4}$, $\frac{4}{4}$, $\frac{2}{2}$, $\frac{3}{2}$, $\frac{4}{2}$. The divided beat or $\frac{2}{4}$ meter can be taught by comparison with $\frac{2}{2}$; as,



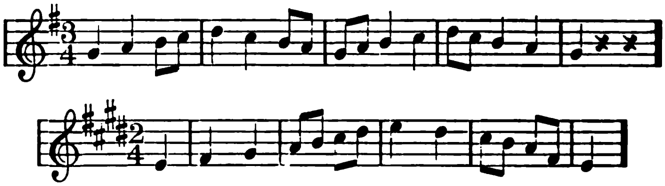
Then $\frac{3}{4}$, $\frac{3}{2}$ and $\frac{3}{8}$:



Then:



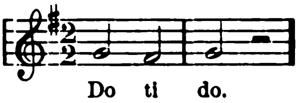
The children must hear and recognize various combinations of divided and undivided beats in different meters and write what they hear· as,



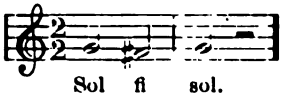
In presenting a new point in rhythm there should be no difficulty in tone. So in presenting new problems in tone all difficulties in rhythm should be dropped. In other words, present one thing at a time and give the necessary drill and many applications in sight reading exercises and songs before combining it with another new problem.

The new tonal problem in the third year is the introduction of chromatics. Sharp four, being the most commonly used chromatic tone, is the first to be presented, and it is introduced by comparison with something already familiar and in the following manner. The pupils sing exercise A,

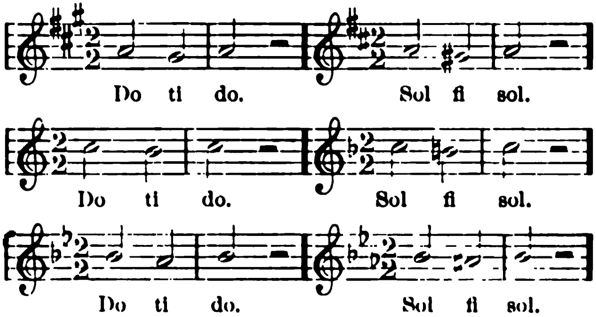
A



B



first with *do-ti-do*, then with *loo-loo-loo.* Exercise B sounds just the same and is first sung with *loo-loo-loo*, then with the syllables, *sol-fi-sol.* For drill this is worked out in various keys. For instance,



Do not expect to master the rhythmic problem before presenting the chromatic, but do not present them in the same exercise before each one is well mastered. Keep the rhythmic and tonal problems advancing on parallel lines until they can be combined. At the same time keep up the practice of reading exercises containing skips without chromatics and various rhythms without the divided beat.

To accomplish results it is necessary to put into the hands of the pupils a properly graded series of exercises and songs, suggestions for which are given at the end of this lesson.

12. General Suggestions. — The various phases of the music work must progress evenly. Do not allow the pupils to become weak in any line. If they have difficulty with time, give them additional rhythmical exercises. If they keep good time and are weak in the matter of tone, strengthen that part of the work.

It is well for the teacher to have in mind a general program or order for each recitation, such as the following:

1. Vocal drill.
2. Ear training; oral, written.
3. General chart or blackboard drill.
4. Drill on special point.
5. Sight reading.
6. Songs.

It is not possible to take up every point in each recitation, but with such a plan in mind, no phase of the subject will be neglected.

Before you begin the lesson, have it definitely settled in your own mind what points you mean to touch and just how much time you mean to give each.

Have a definite end in view for each recitation and make every part of the lesson contribute to the accomplishment of this end. Make every minute count.

Remember that in the study of music we work for skill, for facility in doing. Do not waste time in talking *about* things, but keep the pupils *doing* something. Dr. E. E. White says, "The desire for efficiency in *action* is one of the strongest impulses of childhood."

All drill should be for a definite purpose. Drill on principles or typical forms. Drill is effective only when there is interested attention and concentration on the part of the class. It should not be carried to the point of weariness. When possible, there should be an application of the principle in a sight reading exercise before leaving the lesson.

Have a happy spirit in the music period. You cannot scold children into singing, and a smiling countenance helps in the production of good tone.

13. Helpful Books for Teachers.—

(*a*) Primary Rote Songs	
Gaynor, Jessie L., *Songs of the Child World*, John Church Company, Cincinnati. Vol. I	$1.00
Vol. II	.75
Walker and Jenks, *Songs and Games for Little Ones*, Oliver Ditson & Co., Boston	2.00
Smith, Eleanor, *A Primer of Vocal Music* (Modern Music Series), Silver, Burdett & Co., Chicago	.25
(*b*) First Steps in Music Training	
Ripley and Tapper, *Rote Song Book: First Steps in Music*, American Book Company, Chicago	.40
(*c*) Graded Music Courses	
American Music Reader, No. 1, Macmillan Co., New York	.38
Foresman, R. (editor) *A Common School Book of Vocal Music*, Silver, Burdett & Co., Chicago	4.00
Harmonic Primer, Natural Music Course, American Book Company, Chicago	.30
New First Music Reader, Educational Music Course; Ginn & Co., Chicago	.30
Novello Music Primer, Novello, Ewer & Co., New York	.35
(*d*) For Mixed Grades	
Common School Song Reader, Ginn & Co., Chicago	.36
Ripley and Tapper, *Short Course in Music*, American Book Company, Chicago; Book One	.35
Book Two	.40
(*e*) Charts	
Natural Music Charts, Series A, B, C, American Book Company, Chicago each	4.00
Educational Music Charts, Ginn & Co., Chicago. Introductory Chart (to precede *First Reader*); First Chart (supplementary); Second Chart (supplementary); Third Chart (supplementary) each	6.00

TEST QUESTIONS

1. What is the value of music as a public school study?

2. How prevent injury to the children's voices? What is the best means for securing a "vital tone"?

3. What subject is analogous to music in the method of

presentation? How many and what are the steps to the general method?

4. What is the value of the rote song? When and how long should it be used?

5. How would you select and present a rote song?

6. Will all children be able to learn a song without preliminary work? How would you teach the scale?

7. Describe the process of *recognition.* What two elements have to be considered in music?

8. Describe a lesson in recognition and representation.

9. What is meant by interpretation? Does this apply to songs alone?

10. How would you modify this method for adult pupils?

CONCLUSION

FUNDAMENTAL PRINCIPLES

In the foregoing pages all formal discussion of psychological principles has been purposely avoided, but it is believed that the comprehension of the lessons has prepared the student to follow understandingly a brief discussion of the fundamental principles underlying all method.

1. **Perception.**—The mental powers are aroused to activity through sense-perception — that is, by ideas received through the special senses. Wherever this method of obtaining ideas is mentioned, it is referred to as *observation.* In all the lessons the teacher is urged to lead the pupils to observe as the first step in acquiring new ideas. For example, in the first lesson in *Reading*, each child is given an object and asked to tell something about it. Specific directions for the use of objects are also given in the lessons *Number* and *Nature Study*, and the lesson *Sense-Training* is devoted to instruction for securing full development of all the child's observational powers.

2. **The Individual Notion.**—Ideas obtained through the senses are distinct from one another, as the idea of an apple, of a box and of a horse. Various names, such as percept, sense-percept, individual idea and individual notion, are given these ideas by different authors, but the term *notion* is the one in most general use. Many of these individual notions are very complex. The boy's apple contains the qualities of color, form, odor, taste, etc., all of which are combined in his notion of it. The idea of these qualities can be perceived only by bringing all the senses to bear upon the object and the perception of most objects is possible

only by the combined action of two cr more senses, some of which, as taste and smell, are very closely related.

From the perception of material objects the child passes to the perception of objects of the mind, or those that cannot be perceived by the senses, as the relation of one quantity to another and the perception of right and wrong. Individual notions of this sort are best obtained through concrete illustrations. By separating six apples into groups of twos and counting the groups the child obtains the notion that two apples are one-third of six apples. This notion is individual and is confined to the relation of groups of apples. It has been obtained through concrete illustration, but it is a notion of relation and cannot be perceived by the senses. In a like manner fables and myths serve as excellent concrete illustrations of individual notions of moral principles. For these reasons the use of objects and the employment of myths, fables and numerous poems referred to in the various lessons of the work is for the purpose of enabling the teacher through concrete illustrations to assist the child in obtaining individual notions of this sort.

3. **The General Notion.**—The first step then in the acquisition of knowledge is the formation of individual notions and the second is grouping these notions according to their relation into classes, which involves the formation of the general notion or concept. This is a much more complex and difficult process and demands the exercise of all the mental powers. The general notion consists of a combination of qualities common to all objects which it includes. It cannot be perceived by the senses and in its formation the qualities must be abstracted from individual notions, compared with qualities already in the mind and then combined in accordance with their association with the objects observed.

The general notion is the more difficult to apprehend, as we can have no concrete illustration of it. If we say *man*, there comes into consciousness a number of men, one after another, each having his own characteristics in height, features, color of hair, eyes, etc., but we do not perceive man in the abstract. What we do is to apply the qualities common to all men to the images that appear in consciousness, decide that each image agrees with these qualities and that it represents a man. The application to the particular idea presented is so sudden that we take no note of the general notion.

General notions are formed only after obtaining a store of individual notions of the same sort. A child who has seen only red apples would have in his notion of apples only the qualities of those he has seen and could not at first include in it green or yellow apples. Before this can be done he must observe the qualities of the red apples seen before. In doing this he recalls in consciousness the qualities before perceived, thus using his memory, and compares the qualities of the new apple with these. In making this comparison he is using his thinking powers, which lead him to decide or judge thatthe qualities compared do or do not agree. Finding an agreement between the qualities common to the new and old ideas, he adds the new apple to his general notion of that fruit and thereby extends the notion to include more than before.

This process begins early, and before the child enters school he has a good stock of general notions; but many of them are incomplete, while others are full of error. The teacher needs first to assist the child in correcting the general notions he already possesses, then to lead him to form others. This principle is emphasized in all the lessons but especially in *Reading* and *Language*

It is obvious that correct general notions can be formed only from correct individual notions and that these latter are obtained only through the most careful observation, many times repeated so that the ideas obtained will become fixed in the mind. Hence are given the repeated injunctions to present ideas that are naturally related to each other and to review each lesson frequently until the pupils have thoroughly assimilated its subject matter.

Again, new ideas are significant only to the extent to which they can be related to knowledge already in mind. Therefore the teacher begins her work in primary grades by the use of objects with which the pupils are already familiar. There are manifold illustrations of this principle in the text, but it is especially emphasized in Lesson Eighteen, where the introduction of the textbook in geography is discussed.

By the *content* of a notion we mean the qualities that it contains; and by the *extent*, the number of objects to which it applies. When the child added green and yellow apples to his notion of apple, he extended it, but in so doing he was compelled to discard the quality color and other qualities not common to the apples included. With the observation of other varieties more qualities would undoubtedly be discarded, until his general notion would include only those common to all apples. His notion then would have the broadest possible extent and the fewest qualities, or smallest content. In general, the greater the content of a notion, the less its extent; for with every additional quality, objects to which the notion before applied must be rejected. The formation of those general notions having a wide extent, such as the general classes in botany and zoölogy, requires a high type of reasoning, not to be expected of pupils below the high school. On the other hand, the ability to form correct general notions within the range of the pupil's mental capacity is of the greatest importance and should be cultivated assiduously. Such notions are often expressed in the form of definitions or rules, and the lessons in *Number* and *Language* contain illustrations showing how the teacher can lead up to general notions of this sort.

To enrich a child's vocabulary is to give a more extended meaning to the words he already uses, and this is best done by leading him first to perfect his general notions, then to extend them. To the botanist the term *tree* signifies the plants of all climes possessing the qualities common to all trees; while to the lumberman the same term usually signifies a plant capable of producing so many feet of boards. The first notion, although including fewer qualities because of its broader application, is much the richer. To increase the child's vocabulary should be to increase his stock of ideas, but unless care is used he may memorize many words having little or no meaning to him. For this reason, the importance of so presenting the various subjects that the pupil will comprehend all terms used is emphasized throughout the lessons.

4. Application of the General Notion.—The third step in the process is the application of the general notion to the individual notion. For instance, the boy in examining a bat must decide that it is or is not a mouse. The pupil in the number class must apply the rule which he formulated for adding fractions to the addition of other fractions than those given in the text, and the pupil in language must be able to distinguish nouns and verbs in other selections than those studied in the lesson. This step is the final test of the work, for application is the final test of knowledge. Unless the pupil can apply his knowledge to new objects and new ideas, thus classifying them and adding them to his store already acquired, you may be sure that his general notions are not well defined and that he has memorized words which convey little meaning to him. The teacher is constantly urged to have the pupils do the work themselves under her direction.

The man who can detect a general law which unifies details and can apply such law to the solution of his daily problems is the one who is bound to succeed. In order that he may do this he should early in life form the habit of passing from individual to general notions and from these back to individual notions, and one step should become as easy as the other. The foundation of this habit should be laid by the primary teacher, first, by leading the pupils to obtain correct ideas, then properly to classify these ideas and finally to apply the laws and principles to the assimilation of new knowledge presented from day to day.

5. Interest and Volition.—All knowledge is gained through the self-activity of the learner. The first requisite in securing this activity is interest, or a feeling on the part of the pupil that a knowledge of the subject will satisfy a want. This desire to know leads the child to direct his attention to the subject, and directing the attention is an act of will. Interest and will or volition, then, accompany every act of learning, and the successful teacher knows how to arouse and direct these activities in her pupils.

Direct interest is that which centers in the subject immediately at hand, as interest in a flower, an apple or a mathematical problem. It is the beauty of the flower, the flavor of the apple, the desire to solve the problem that holds the child's attention. Indirect interest is interest in a result of a more general nature, and arises from the effort stimulated by direct interest, as the gaining of power arises from the solution of a problem, or the culture of the æsthetic nature through the study of a flower. Young children are seldom attracted by indirect interest, and the teacher who appeals to them to perform present duties because these lead to remote results usually fails, however attractive the results may be.

Children are interested in material things—flowers, animals, pictures and, more than all, in other children. Therefore, to secure their attention and to enable them to direct their volitions along right lines, objects, fables, myths and other stories are necessary. From this point of view the value to the teacher of a thorough knowledge of the natural sciences and of juvenile literature can not be overemphasized, and one of the most valuable features of this work lies in the assistance it gives the teacher in making this preparation.

Through interest the child is led to sustained energy which in time develops into a habit of effort. In the portions of the work devoted to discipline and management, the importance of will training is emphasized; the importance of directing the child's activity through interest is made prominent in all of the lessons on methods, and indirectly the teacher is led to feel that to increase the power and to develop the character of her pupils should be her chief purpose.

THE WORK BY GRADES

6. Correlation of Subjects. — While containing many specific suggestions and directions, Part One is of such nature as to be helpful in the organization of any school. In Part Two the lessons are arranged in groups, each of which constitutes a method—whole for the work of the first three years. These groups are reading, number, sense-training, nature study, language, drawing and music.

Lessons Six, Seven, Eight, Nine and Seventeen, treating directly of reading and language, are closely related, yet the work in language is so universal in its application that Lesson Seventeen is more or less closely related to every one of the other lessons of Part Two. Lessons Ten, Eleven and Twelve, the number group, form a complete unit by themselves, yet it is easily seen how nature study and language can be made to contribute to the success of arithmetic, and this relation should not be overlooked by the teacher.

Lesson Thirteen, *Sense-Training*, while forming a unit by itself, emphasizes principles and practices that should be inculcated in teaching every subject; and Lesson Nineteen, *Drawing*, sustains a similar relation to the other lessons of Part Two.

The nature study group is more complex, including two lessons, Fifteen and Sixteen, devoted directly to the subject; and two others, Fourteen, *Physiology*, and Eighteen, *Geography*, which from the character of the topics treated are allied to nature study.

By grouping the lessons in this manner, the correlation of studies for the first three years is easily seen, and the teacher can pursue the work in the order here outlined without detriment, if she so desires. However, the lessons on reading are so related to each other that it is necessary to study the entire group in order to obtain all of the ideas upon the teaching of this subject. The same fact is true of the number lessons.

7. Work of the First Year.—The first few pages of each lesson are usually devoted to a discussion of general principles and the preparation necessary for the teacher. The outline of the work by grades then follows. Reading and number each have a lesson devoted to each grade. Anyone wishing to pick out the work in all the branches for the first grade can do so by reading the following lessons and parts of lessons in the order given: Lesson Six, Lesson Ten, pp. 223-226 and 236-251; Lesson Nine, Lesson Thirteen; Lesson Fourteen, pp. 357-363; Lesson Fifteen, pp. 385-394;

Lesson Sixteen, pp. 425-426; Lesson Seventeen, pp. 455-473; Lesson Eighteen, pp. 498-501; Lesson Nineteen, pp. 553-558; Lesson Twenty, 591. In every instance the work of the second grade immediately follows that of the first, and the work of the third grade follows that of the second. The work of each of these grades can easily be selected by pursuing a similiar plan of reading.

The successful teacher must have a good academic education, a range of knowledge extending far beyond what she is required to teach; she must also be conversant with the best methods of instruction; but more than all, she must possess sweetness of spirit and culture of soul.

"She must possess the true spirit of a teacher: a spirit that elevates above everything else the nature and possibilities of the human soul and that trembles at the responsibility of attempting to be its educator; a spirit that earnestly inquires what is right and that dreads to do what is wrong; a spirit that can recognize and reverence the handiwork of God in every child, and that burns with a desire to be instrumental in training it to the highest attainment of which it is capable. Such a spirit is the first thing to be sought by the teacher."

To impress the importance of this truth has been one of the principal aims of these lessons. In lessons One and Four, particular emphasis is placed upon the influence and example of the teacher and the heart qualities there mentioned are referred to again and again in the pages that follow.

As a final message to the student-teachers, the authors and editors of this course join in saying:

Be in earnest; be competent; be sincere; be honest; be sympathetic; have faith, especially in children; have love; have a high ideal of life; persistently and faithfully perform your daily duties, building tomorrow upon the foundation of today, knowing that in the world of the future men will need to have broader minds, higher ideals, deeper sympathy and greater love than in the world of the past. Do these things and you will develop in your pupils that power and that character which will fit them to be worthy citizens and useful men and women.

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